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ANNALES

D'OCULISTIQUE

Founded by **FLORENT CUNIER** and continued by **WARLOMONT**

EDITED, PARIS,
BY

Dr. E. VALUDE
De la Clinique Nationale Ophtalmologique des Quinze-Vingts.

(*French Edition*)

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NEW YORK
BY
Dr. GEORGE T. STEVENS
(*English Edition*)

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FIFTY-EIGHTH YEAR.—NEW SERIES.—B
VOL. CXIII.—NO. 1

January, 1895

THE TRANSATLANTIC PUBLISHING COMPANY
NEW YORK
63 FIFTH AVENUE

PARIS
198 BOULEVARD SAINT-GERMAIN

LONDON
96 HENRIETTA ST., COVENT GARDEN

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1895

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A NOS LECTEURS.

Nous sommes heureux d'avior une bonne nouvelle à annoncer à nos collaborateurs et à nos lecteurs.

A compter du premier Janvier de cette année, une Edition anglaise DES ANNALES D'OCULISTIQUE, reproduction exacte de notre edition de Paris, sera publié à New York sous la direction du Dr. George T. Stevens.

Mais puisqu'il s'agit ici d'une transformation qui est necessitée par le succès croissant des Annales, il est juste et il nous est agréable d'en remercier avant tout nos collaborateurs et nos correspondants puisque c'est gràce a leur travaux et leur concours zélé que le Journal a pu acquirer un tel développement. Le Dr. Stevens trouvera ansi un terrain tout préparé et des moyens d'action qui lui assuront la reussite dans les efforts qu'il fait en faveur de l'œuvre commune. Les Annales, d'autre part, ne pouvent que se feliciter de la collaboration, que Monsieur Stevens et ses amis leur apporteront.

Et c'est d'ailleurs par ce dédoublement des Annales d'Oculistique en deux editions de langue differente, mieux que par des paroles, que nous pourrons remercier nos excellents collaborateurs. Nous pensons, en effet, que ils se réjouiront comme nous-mêmes, de voir leurs idées et leur travaux confiés à une publication si efficace.

Chacun des facicules mensuels des Annales d'Oculistique paraitra à peu près en même temps à Paris et à New York. Nous rappelons à cette occasion que toute communication relative à le redaction de l'une quelconque des deux editions peut être faite soit au Dr. Valude, 198 Boulevard Saint Germain, Paris, soit au Dr. Sulzer, 7 Quai du Mont Blanc, Genève, soit au Dr. Stevens, 33 West 33d Street, New York.

Nous profitons en outre de la circonstance pour rappeler à tous aux qui nous font ou voudront nous faire l'honneur de leur collaboration que, pour donner toute facilité aux auteurs auxquels la langue francaise est peu familierè, une service special de traductions est attaché à notre journal. Des traveaux peuvent nous être adressés en Anglaise, Allemand, Italien, Espagnol, Hollandais, Russe, et en Danois.

SULZER.
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114901

ANNOUNCEMENT

From the time when, in 1838, *the leader in ophthalmological thought, Cunier, founded the Annales d'Oculistique as the pioneer in ophthalmological journalism to the day when he closed his life work with his hand upon its proof-sheets, the fame of the journal which he had established as a forlorn hope, as well as its beneficent influence in elevating the specialty of ophthalmology had extended, year by year, until it had reached all civilized lands.*

During the many succeeding years of its success under the direction of Warlomont, the Annales attained to a still greater influence. In all its fifty-seven years of existence Annales d'Oculistique has maintained its position as a leader in ophthalmological thought and as a most complete record of the grand progress of the science.

Distinguished for its enterprise, its dignity, and its independence, it has held a foremost rank in all countries where ophthalmology has been studied.

Of those who have served upon its staff as regular collaborators, it is sufficient to recall from the long list of distinguished names, those of Sir James Bowman, Ed. Jaeger, Sichel, Giraud-Teulon, Lawrence, Mackenzie, Crittchet and Desmarres, while such illustrious teachers as Von Graefe, Donders, and scores of others who have lent the greatest impulse to the progress of ophthalmology, have employed its pages to record their studies and their experiences.

Since the death of Warlomont and the assumption of the control of the journal by the present management greater progress than ever has been made, and it is safe to say that no more complete resume of American ophthalmological literature exists than is to be found in its pages.

It has long been the wish of the directors to make the journal in every respect an international medium of communication between all who are interested in the study of its branch of science.

With the present number the member of the staff who has for the past four years acted as the American collaborator assumes the direction of an edition to be published in English.

The two editions will be entirely uniform, all articles appearing in one edition appearing also in the other.

In future issues original communications from American and English writers will constitute a much more prominent feature in the pages of the journal than they have in the past.

The aim of the directors, on both sides of the Atlantic, will be not only to maintain the distinguished place which the journal has always occupied in ophthalmological literature, but to advance its usefulness with the progress of the science.

The journal will be, as it has always been, free from personal bias, serving only the cause of scientific truth.

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CONDITIONS OF PUBLICATION AND OF SUBSCRIPTION

The **Annales d'Oculistique** commences its fifty-eighth year as an actual international periodical, being published simultaneously and uniformly each month in the French and English languages. Each number contains from 64 to 80 pages, forming annually two volumes of about 1,000 pages.

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The subscription price of the English edition is **five dollars** a year. Subscriptions may be sent by mail from any country, inclosing draft or postal order.

Subscriptions should be addressed for the English edition to The Transatlantic Publishing Co., 63 Fifth Avenue, New York ; and for the French edition to Dr. E. Valude, 198 Boulevard Saint-Germain, Paris.

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Dr. GEORGE T. STEVENS, 33 West Thirty-Third Street, New York, for the English edition; or to Dr. E. VALUDE, 198 Boulevard Saint-Germain, Paris, or to Dr. D. E. SULZER, 7 Quai du Mont Blanc, Geneva, Switzerland, for the French edition.

All articles appearing in one edition will appear also in the other. *The advantages* of this arrangement will be apparent to authors.

ANNALES D'OCULISTIQUE

Volume CXIII.—Number 1.

JANUARY, 1895.

I.—ORIGINAL CONTRIBUTIONS

MEMOIRS

OPTIC NEURITIS CONSECUTIVE TO OZÆNA

By Dr. D. E. SULZER

Little by little, recent publications have reduced the group, formerly quite respectable, of rheumatic and idiopathic varieties of optic neuritis.

While that group holds a conspicuous place in the Handbook of Graefe and Sæmish, published in 1877, we look for it in vain in the most recent of the great treatises on ophthalmology, that of Panas. The greater number of cases of optic neuritis have now been ascribed to general affections or to intoxicants.

In this discussion I shall pass by the optic neuritis which is characteristic of locomotor ataxia, that of multiple sclerosis, the forms consecutive to different affections of the encephalon and its envelopes, and traumatism of these parts, as well as those affections of the optic nerve associated with acute infectious diseases and their complications, among which at present the grippe holds the place of honor, in order to give attention to blennorrhagic optic neuritis. Although still but little known, this ranks with the blennorrhagic sciaticas and myelites first described at the commencement of the present century by Everard

Home, and in 1856 by Stanley; blennorrhagic localizations, to which Pidoux added, still later, purulent spinal meningitis, and Ricord, blennorrhagic hemiplegia and paraplegia. Since then observations of blennorrhagic metastases have become familiar, and the results of bacteriological examination have, of late, repeatedly shown the complex nature of the infections which enter through the urethra. Through this open door pass the white staphylococcus and the streptococcus associated with the gonococcus, with the result of an invasion of the urethral epithelium.

We owe the first observation of blennorrhagic optic neuritis to Panas, an observation found in his treatise. A person twenty-nine years of age, in good health, in 1889 became subject to a second urethral blennorrhagia, complicated with sciatica, which obliged him to keep his bed for three months. Twelve days after the onset of the disease he suddenly lost the vision of the right side, as a result of a chill coming on during convalescence. The ophthalmoscope showed the existence of a "papillo-neuritis."

In connection with blennorrhagic neuritis should be mentioned inflammations of the optic nerve of uterine origin. Long admitted and recognized as results of infectious puerperal conditions, they are much less known in connection with non-puerperal uterine affections. In this last category we should place a large part of an extended clinical group: the blindnesses and amblyopias consecutive to suppression of the menses, or coming on at the time of these epochs. A part of these cases, probably the most numerous, are the result of uterine affection complicated by an infectious optic neuritis, having for its cause the abdominal trouble. Then, another part of these cases, less in number, are consecutive to hemorrhages in the orbit or in the sheaths of the optic nerve, hemorrhages to which has been given the ill-chosen designation "vicarious." The primitive infectious disease may be located in any part of the genito-urinary tract. I am attending at the present time a woman subject to an infectious neuro-choroiditis with regular exacerbations, consecutive to periodic returns of an old cystitis, with staphylococci, a cystitis the origin of which is unknown.

Optic neurites consecutive to inflammations of the sinuses have drawn attention successively to the frontal, maxillary, and sphenoidal sinuses. Periostites and ostites which invade the fatty cellular tissues of the orbit easily explain the genesis of an optic neuritis, but such cases are rare. The same may be said of traumatic cases, or those consecutive to surgical operations in the nose. Ordinarily it is, in these instances, a matter of empyema of a sinus, complicated or not with an osseous affection. Such inflammations of the sinuses are consecutive also to influenza, to measles and scarlatina, to erysipelas of the face, and to typhoid fever. Patients often attribute an important rôle to traumatisms which have occurred at times more or less remote, and previous to the purulent collection. The diagnosis is but rarely simplified by the presence of a fistula. Certainty in the diagnosis may be established in case of the maxillary sinus by means of a small incandescent lamp introduced into the closed mouth in a darkened room. Cases of ocular affections consecutive to dental periostitis are, in many instances, explained by the intervening maxillary empyema. Chronic rhinitis, with or without ozæna, the morning discharge of pus, the exacerbating pain having its centre at the level of the sinus, are the most characteristic symptoms of an abscess of the sinus. An erysipelatous redness at the root of the nose with tumefaction of the eyelids accompanies empyema of the ethmoidal sinus, while redness, with swelling at the forehead, and especially at the orbital circle, is observed in advanced empyema of the frontal sinus. In the absence of redness, the sensibility to pressure of the orbital walls is an important sign. I have not been able to recognize any symptom of abscess of a sinus in the cases of ozæna complicated with optic neuritis which have been presented to my observation, and the absence of any purulent collection in the cranio-facial sinuses has been confirmed by the clinical history, by illumination, and by catheterization. In the first of the cases observed there was an idiopathic atrophic ozæna, odor slightly offensive, yet characteristic and with reduced secretion; the second case was one symptomatic of ulceration of the left middle turbinated bone, with a terrible odor, and with an abundant secretion. The two cases are notable from their long duration. The first patient, thirty-four years of age, has been subject to ozæna from early youth. Seventeen years ago he submitted to a radicle operation. Since then he makes free irrigations of boric acid solutions twice a day, with the result of mitigating the fœtid odor. Of late, owing to a multiplicity of occupations, these attentions have been somewhat neglected. The nose, slightly flattened, is rather dry. Exploration with the speculum shows the turbinated bones of right side small, leaving very spacious cavities lined with a shining membrane. There was complete absence of tonsils. The turbinated bones of left side were wanting, and the posterior portion of the ceptum had, in like manner, disappeared, the whole having been resected seventeen years ago.

This patient consulted me July 27, 1892. He had observed during the last ten or fifteen days an obscurely veiled portion situated at the lower and inner part of the visual field of the left eye. In this portion objects are indistinctly seen, and with fringed borders. The obscure portion is projected into a space brighter than in the uniform field, a space resembling that of the polarimeter or of the microscope.

The eye itself feels heavy and fatigued, and the head dull. At evening the patient sees only the upper half of letters in reading. The central visual acuity is normal for both sides. Examination by the perimeter revealed a large irregular scotoma in the left visual field, comprising almost the whole of the inferior half, but without extending to the point of fixation. By the ophthalmoscope the papilla of the right optic nerve was found red and swollen, the redness and swelling being located almost exclusively in the superior part of the papilla, encroaching a little upon the lower half only at the nasal side. On this side, at the level of the horizontal diameter of the papilla, was seen a small hemorrhage between the fibres of the optic nerve. It was close to a branch of the central vein which was much swollen. Questioned in regard to his ozæna, the patient declared that the nose had suffered long before the appearance of the visual troubles. Meanwhile, the secretion, hitherto scanty, was arrested. A thorough examination revealed no indication of any affection of the sinuses, and the patient had never observed at any time an abundant discharge.

This patient does not present any disease or constitutional vice by which we may explain the origin of this partial papillitis. My first impression was that there would be found empyemia or caries in the ethmoidal sinus and cells. During more than two years of observation, no symptom has become manifest which could justify the supposition. It seems, therefore, probable that it is a question of a partial optic neuritis consecutive to ozæna. This supposition, the only one possible for explaining the origin of the affection, becomes the more probable as the amelioration of ocular trouble progresses in proportion to the improved condition of the nose. The lacuna of the visual field completely disappeared after three months, although the ophthalmoscopic lesions have never entirely ceased to be visible. The scotoma has, however, reappeared on several occasions, as the result of fatigue from much walking, or from reading. The border of the superior half of the optic disc remains indistinct, and the nervous fibres are less than normally transparent. These alterations indicate the existence of an interstitial neuritis.

The treatment, from the commencement, has been directed to the condition of the nose. The irrigations of boric acid solutions twice a day have been replaced by irrigations, frequently repeated, of resorcin 1-100. Iodide of potassium taken in the dose of 1.50 grammes daily induced an iodic coryza which facilitated the cleansing the membrane. The treatment was supplemented by mercurial frictions to the forehead and temple and the application of the artificial leach to the left temple. This treatment was immediately followed by a diminution of the scotoma, the limits of which had extended to the point of fixation. The scotoma at the same time became less dense and less troublesome. But it was only after three months that the patient ceased to observe the appearance of the field of the microscope and polarimeter. The perception of colors, which was completely absent in the lower half of the field of vision at the commencement of the affection, is not yet completely reestablished. In this part of the field, colors appear to the patient different from those in the rest of the visual field.

In the second case, a woman aged twenty-seven, the ocular affection is double. A watchmaker by trade, she has been obliged to abandon her calling by reason of insufficient vision, which has failed during several years, and which has not been improved by convex glasses, which have on several occasions been prescribed. Having lost the place of domestic which she has occupied during two years, she has found employment in a tailor's establishment, where the indifference of her vision renders her work difficult and often impossible. In the morning she sees passably, but after a time at work, of more or less duration, a cloud which covers a part of the visual field extends in such a manner as to obscure her work.

Central vision is considerably diminished, being 1-3 normal for the right, and 1-2 normal for the left. The lower half of the visual field is absent on both sides. The line of separation, which is irregular, is changeable, and encroaches upon the point of fixation. Accommodation is normal.

With the ophthalmoscope there is perceived at the first glance a great difference between the inferior and the superior halves of the papillæ of the optic nerves. On both sides the upper halves are red and swollen, and poorly defined. The changes are more pronounced in the left than in the right. The retinal veins are very full.

The patient enjoys excellent health and shows no trouble which affords a clue to cause and effect with an ocular affection, except an ozæna existing since her early youth. She is forced to snuff water into the nose several times a day in order to render her condition endurable to those who are about her. The first cleansing in the morning brings out a large quantity of matter, but the patient has never remarked anything resembling carious bone. The left nasal fossas, especially the middle turbinated bone, are covered with yellow crusts, emitting an intensely nauseous odor. The posterior portions of the middle turbinated present a superficial alteration which does not expose the bone.

In this case the treatment was directed exclusively to the nasal affection. Warm irrigations of boric acid solutions served to prevent the formation of crusts, and were presently followed by a notable amelioration of the pituitary swelling. The central acuity of vision and the extent of the field of vision augmented in degree and proportion to the amelioration of the nasal trouble. From 5-15 for the left and 5-10 for the right, the first had become 5-10 and the other 5-6 after ten days of treatment, and the ophthalmoscopic symptoms had almost disappeared in this brief time.

These facts establish the coincidence of a nasal affection coming within the great class of ozænas, with an ocular trouble characterized, as shown by the ophthalmoscope, by an interstitial inflammation of the optic nerve. Does there exist the relation of cause and effect between the two affections? It must be said that there is no symptom which proves this directly, but it seems to me that there are circumstances which render it very probable.

The clinical and ophthalmoscopic symptoms are in both cases characteristic and almost identical: a lacune of the visual field comprising the lower half, and perceived by the patient as a cloud or veil. The visual organ becomes easily fatigued, and the fatigue is followed by an enlargement of the scotoma. With the ophthalmoscope there is observed a papillitis of the superior halves of the optic nerves, the lower portion being normal, or nearly so. This localization of a papillitis is very rare, and has not been observed, so far as I can discover, except in affections of the base of the brain and of the skull.

No symptom permits us to suppose the existence of such an affection in the two cases described, especially in the first. By a process of exclusion one arrives at a recognition of the pituitary affection as the cause of the optic neuritis.

Is it a case, in such instances, of a propagation, by gradual approach, of the infectious process by the vascular or lymphatic canals, or of the distant action of toxines, as we observe it in the Loeffler bacillus in post-diphtheritic paralysis or the bacillus of tetanus? The facts observed do not apparently permit of a decision of the question. The symmetrical localization in the two cases observed argues in favor of the propagation by gradual approach by means of a pre-existing channel. On the other hand, it is not to be forgotten that neuritis is often the result of infectious action at a distance, or of intoxicants.

In that which concerns the relations which can exist between optic nerve affections and the visual field, I refrain from any conclusion. An autopsy alone could clear up that interesting point.

Whatever they may be, I have thought it fitting to record the facts, leaving to future observers the task of elucidating the points still obscure, and to confirm or refute the above explanations.

THE HISTORY OF ARTIFICIAL EYES (1)

By Dr. **PANSIER** (Avignon).

The custom of painting the eyes dates from the greatest antiquity. Paris, son of Priam (*vide* Philostrato in Heroicis), and Sardanapalus painted their eyes and eyebrows.

This custom has been perpetuated, and to-day how great is the number of those who follow the example of these fabled kings.

"Pour réparer des ans l'irréparable outrage."

This embellishment which art brings to nature may be considered as a first step preceding the history of ocular prosthesis. It only began at the time when man employed artifice to hide a deformity which resulted from the loss of an organ.

After this began the first prosthesis, the *ecblepharon*, the origin of which is prior to Paul of Ægina.

The art of the sculptor also incited man to attempt to obtain an exact representation of the appearance of the exterior of the eye. Phidias (IV. Cent. B. C.), wishing to bestow infinite pains upon the execution of a statue of Minerva destined for the Parthenon in Athens, made of ivory every part of the body except the eyes, the iris of which was made of a stone specially selected.

---

(1) Fragment of a brochure in course of publication. Maloine, éd. Paris.

Artificial eyes must have been employed by primitive peoples to give to their mummies a more lifelike aspect. "Father Acosta, and Garcilasso de la Vega declare that they saw mummies of the Incas and several Mamas which retained their hair and eyebrows, and which had been supplied with eyes of gold" (Buffon: Article on Mummies). Certain ancient peoples of the New World furnished their mummies with eyes of cephalopods. These eyes, which are very calcareous, are susceptible of acquiring a fine lustre, and they are in demand by the jewellers of New York, who introduce them into ornaments as a novelty in precious stones.

In the article "*Prothèse*," in the *Dictionnaire des sciences medicales* of 1820, it is stated: "Mummies had the eyes replaced by a plate of silver coated with white enamel." Ritterich questions this assertion, saying: "The nature of the mummies themselves renders this fact improbable, since the bodies were enveloped in plaster bands in a way which covered the eyes, thereby making such an embellishment useless."

However, the process of preservation itself seems to indicate the removal of the ocular globe: "According to Herodotus, the brains were removed through the nostrils, and as they were drawn out they were carefully replaced by perfumes. Then the stomach was cut near the flank with a well-sharpened stone and emptied" (Buffon: Article on Mummies). It is hardly probable that the ocular globe was respected, the desiccation of which in its place was difficult to accomplish. And as Diodorus Siculus adds, in speaking of mummified bodies, "They were not disfigured in any way," the ocular globe must have been replaced by some foreign substance.

Ritterich, although doubting its credibility, cites the following fact: "In the *Indicateur archeologique* of Gérard, 1850–51, it is said of a mummy unwrapped at London June 11, 1850, that the eyes were found to have been made of a white material, with the pupil (that is, the iris) made of obsidian." I do not see why the fact should be questioned. The ocular cavity being empty, the Egyptian embalmers would have conceived the idea of filling it, and of pouring in, for example, the plaster with which they impregnated their bandages. A piece of obsidian, a stone with a glassy enamel, resembled the iris quite closely.

Moreover, if we are to believe Hazard-Mirault, the Duke of Chaulnes found artificial eyes in Egyptian mummies, badly made and rudely painted. They consisted of a small silver capsule covered with a layer of white enamel, in the centre of which the iris was represented by a brown circle of a single tint, and the pupil by a black and slightly prominent point.

The Egyptians endeavored to reproduce exactly, in their statues, the external appearance of the eye by means of stones of different colors.

The statue of Ra-em-ké, one of the most beautiful survivals of the art of ancient Egypt, is thus described: "The eyes, which have so lifelike an expression as to be disquieting, are enveloped in bronze cases which represent eyelids, the eyeballs themselves being formed of a piece of opaque quartz, in the centre of which a rounded piece of rock crystal represents the pupil. Under the crystal is fixed a brilliant nail which determines the visual point and produces that expression so strikingly lifelike" (Viardot: *Les merveilles de la sculpture*, p. 7). This statue must have been made about the year 4000 before our era.

Four plaster masks discovered in Egypt in the great Oasis are thus described: "The eyes had been reproduced, and, according to the methods in use from the dynasties of the first Pharaohs, were incrusted with a layer of plaster which lent them the brilliancy and smooth appearance of the living eye" (Maspéro: *La Nature*, 1892, p. 306). These busts appear to date from the end of the second century of our era.

In Greece and in Rome this custom continues.

Aristotle relates that in his time some statuettes existed which were even provided with movable artificial eyes. Plutarch tells us that the Spartans tore out the eyes from the statue of Herion before his death, at Leuctra.

In Rome there were makers of artificial eyes for statues:

M. RAPILIVS SERAPIO HIC
AB ARA MARMOREA
OSCVLOS REPOSVIT STATVIS
QVA AD VIXIT BENE.

At the Louvre there may be seen, among the statues of ancient Rome, an Antinous the eyes of which are made of rare stones.

Anastasia, the librarian, in recounting the gifts made to the churches by the Emperor Constantine, mentions four angels made of silver, each weighing 120 pounds, with eyes of precious stones.

Finally, history preserves for us the name of L. Licenius Patroclus, *faber ocularius.*

The idols of certain barbaric peoples of Asia were provided with artificial eyes: "Qui consistant e globules corralenorum globulorum more vitro aut plumbo effectis" (Mauchart).

In the tombs of the early Delaware Indians of North America have been found statuettes of wood and terra cotta the eyes of which were represented by two small white beads (*La Nature*, 1892, p. 261).

Up to this time we have seen artificial eyes more or less perfected only for statues and mummies, but no real prosthesis.

"The invention of the artificial eye," says Guérin, of Lyons (Reported by Deval. *Traité des maladies des yeux*, p. 10, 38), "seems simple enough. An old ape, doubtless of some importance, had, no matter how, lost one of his eyes. He had filled the cavity of the orbit with a mixture of clay and plants of different colors. The whole formed a globe of a composition about the color of the eye that remained. The fraud was only recognized after his death. The reliable naturalist who related this story to me as a fact assures me that nothing surprised him, in the course of his travels, so much as this trait, which illustrates all the sagacity that is recognized in this animal."

I confess that I am quite incredulous in regard to this anecdote, and even if it were true, it would only prove that the monkey, like man, has an innate sentiment, that of concealing from the sight of his fellow-creatures the deformities with which he is afflicted.

Ocular prosthesis must have been known and practised very anciently in Egypt. Ocular medicine among the Egyptians was practised by the priests; their reputation for skill had spread far and wide. Herodotus (Carron du Villars: *Guides des maladies des yeux*, 1888, T. I., p. 93) tells us that Cyrus, King of the Persians, sent ambassadors to Amazis, King of Egypt, praying him to send him the most skilled oculist in Egypt. The refusal of Amazis to listen to this appeal so aroused the indignation of Cyrus that a declaration of war immediately followed.

The Egyptian priests, who enucleated the eyes of their dead that they might insert into the orbit a body intended to replace the natural organ, must have been the first to extend the blessing of this art to the living subject.

"Already," says Woolhouse (Thomas Woolhouse: *Experiences de différentes opérations manuelles et des guérisons qu'il a pratiquées sur les yeux.* Paris, 1711), "in the days of Ptolemy Philadelphus (III. Cent. B. C.) there prevailed a custom of substituting for the ocular globe which had been destroyed by accident, abscess, or any other cause artificial eyes of different kinds."

Woolhouse professed even to have found in the history of Ethiopia mention made of a workman who made a fortune by manufacturing artificial eyes of gold. Woolhouse did not add from what historian he had derived this information, and Mauchart not having been able to confirm this assertion, nor discover the source from which he had collected these facts, gave no credence to them.

Paul of Ægina, who lived in the seventh century of our era, was familiar with the artificial eye, and the description that Ambrose Paré gives of the ecblepharon was borrowed from this Greek physician. This fact, therefore, seems to confirm the assertion of Woolhouse, for the eye of gold in use in the time of Ptolemy was a kind of prosthesis much more perfect than the more clumsy ecblepharon, and if Paul of Ægina had known of its existence he would certainly have mentioned it.

Sennertus (Sennertus: *Pract. Méd.*, p. 881. Wittenberg, 1627) reports that a certain Minadous relates that he had seen at Byzantium a woman who wore an artificial eye. He does not say who this Minadous was, or when he lived. Ambrose Paré is the first author who gives us an exact description of the artificial eye. We read in the works of A. Paré, 1579, 22d book, on the manner of supplying an artificial eye: "They should be of enamelled gold, and of a color resembling that of the natural eye." To the text are added four figures showing the form of these eyes, and their inner and outer surfaces.

In the Paris edition, 1628, following the preceding paragraph and figures, we read: "And if it happens that the eye cannot be introduced within the orbit, another must be constructed, like the one seen in the figure, made of woven iron wire bent into shape and covered with velvet or silk, having one side smooth, so that it will not irritate, and the other side covered with polished leather, to which the painter, by his art, may give the appearance of the natural eye. This done, it should be placed on the orbit. This wire is pliable, and may be bent into proper shape, like the fillet worn by women to hold their hair. The end may be passed over the ear and half-way around the head." Malgaigne remarks that Paré (*Les œuvres d' A. Paré*, édition Malgaigne, T. II., p. 604) acknowledged that he had borrowed this text from Paul of Ægina. This leads us to believe that even in the time of Paré, this instrument of prosthesis, so imperfect, and which Mauchart later called the ecblepharon, was no longer in use, but was mentioned only as an historic reminiscence.

The authors that we encounter later reproduce the descriptions of A. Paré, some literally, others adding to them interesting information.

Fabrice d'Acquapendente is the one who gives us the most complete details in his chapter "de eruto et amisso oculo" (*Edition de Venise*, 1619, p. 181). From his time commences the manufacture of eyes from glass. We are somewhat surprised, therefore, when we see Gaugot and Spillmann (*Arsenal de chirurgie contemporaine*, T. II., 1872) attributing this improvement to a glass-maker of Nevers, "who about 1740 rejected the metallic plate and made eyes of painted glass." Fabrice d'Acquapendente tells us also that when the ocular globe had entirely disappeared they used a spherical artificial eye.

Jessenius (*Instit. Chirur.*, *Witteberg*, 1601) tells us of the value of the form of prosthesis in his time, and says that there lived in

Venice a Florentine goldsmith who made artificial eyes
astonishing skill.

The artificial eye was, however, a rare thing, since W
(Museum seu historia rerum rariorum, *Lyon*, 1655, chapit
"artificiosis et vitreo," p. 362) classes first among his cu
ties an artificial eye of glass. They were careful, in the prost
not to wound the stump, and so covered the posterior surfa
the eye with a layer of lead, a metal easy to polish. As a
ter of fact, the eyes of that epoch appear to have been
more flat than those which we employ to-day, and unfortu
ly their posterior surfaces were apt to press on the stump.

Franck of Franckenau (*Satyr. Med.* Lips, 1722) and L
werdius (in Sculteti Armamentario c. observ. Lamzwerdi
Verduini, 1741) re-edit the description of Paré.

Saint-Yves (*Traité des maladies des yeux*, 1732) in the c
ter "concerning the operation on the eye suitable for th
plication of a false eye," insists on the necessity of preser
a large stump if it is desired that the eye should have
mobility.

Nuck (*Experimenta chirurg.*, 1728, chapitre de "oculo a
cioso") tells us that eyes were made of glass, or even of e
elled metal. Eyes of gold and silver had, therefore, rapidly f
into disuse. To accustom the orbit, he advised that a pie
lead, of the same form as the artificial eye, be worn for the
few days.

Laurent Heister (Institutiones chirurgicæ. Amst., 175
596) devotes an entire chapter to artificial eyes.

Here is the process employed by an enameller of N
about 1750 to manufacture a glass eye: "He traced on
top of a white bead, blown on the nozzle of a pipe, a brow
blue circle, in the centre of which he placed a dark poi
mark the pupil. After having given an oval form to this
shell he opened the lower part of it and smoothed the edg
the flame of a lamp."

We have passed rapidly over the works of Heister, whic
peared at the same time as the thesis of Mauchart ("O
artificialis," *Tubingen*, 1849). The latter, comprising 24 p

s the first complete treatise on ocular prosthesis. We must then come on to 1852 to find a new study truly scientific and medical. This work, the last that has appeared, is due to Professor Retterich of Leipzig.

Mauchart, after having treated quite at length the history of this subject, enumerates the different kinds of eyes that were found: some were for the purpose of giving a physical demonstration (Hamberger: *Dissertatio acad. physico-mathem.* Jena, 1708) of the anotomy of the eye (Verle: Tractatus anatomicœ artificialis oculi humani, in *Opuscula nova anatomica.* Lyon, 1680, p. 170).

In a third category we find some examples intended to represent artificially the different diseases of the eye. At the time of Mauchart, the Parisian artists had acquired in this respect a well-merited reputation. These three categories did not enter into the limits of the study of Mauchart. In the beginning of his thesis Mauchart commenced by discarding the possibility of ocular grafting: "Taliacotii artificio, quo laboriosissima ac ingeniosissima methodo per insitionem, nasos, auriculas, labia oris truncata restituit e traduce viræ carnis felicissime, cujusque vestigia secuti sunt alii, vel hinc tamen inoculi deperditione locust non est, quod si, vel maxime, reliquiis et radici bulbi deperditi novum liceret globum adsuere ac conserruminare carneum, nullus tamen oculi naturalis vel color, vel nitor posset conciliari." This would tend to prove that for a long time the question of ocular grafting had been agitated.

Mauchart divided artificial eyes into two classes: the ecblephari and the hypoblephari.

The ecblepharon was held on the eye by an iron band around the head, as we have seen by the description of it given by A. Paré. It possesses only an historic interest.

Hypoblepharon is the artificial eye that occupies the orbit in the place of the destroyed eyeball. Formerly, says Mauchart, artificial eyes were of gold or silver, *pigmentis vitrescentibus obducti quem galli vocant:* enamelled. For more than a century, he adds, metal has been replaced by glass.

After having indicated in what cases one can employ prosthesis, and the operation required in the presence of a stump too large and painful, Mauchart describes to us in what manner it should be seized to insert or to remove the eye. Some practitioners cover the posterior surface of the eye with wax or lead, but he objects to this practice as uselessly increasing the weight.

Every night the artificial eye should be removed, cleansed with saliva, and dried. The ocular cavity should be cleansed with different liquids, the formulas of which he gives. For his part, he prefers tepid baths applied with a sponge soaked in rose water.

For a long time Venice held a monopoly in the manufacture of glass. A Draconian edict confined the glass-makers to the island of Murano; fugitives were punished with death, and the sbirros were paid and delegated to attack them wherever else they carried their industry. Artificial eyes, also, made in Venice enjoyed great favor for many years. But the secrets of the manufacture of glass escaped from this proud republic in spite of the ostracism of its laws. In Bohemia the art of glass-making presently developed and perfected itself.

In 1665 Colbert bribed some Venetian workmen with gold. Already there existed in France some glass factories, but it was from this epoch on that the industry of glass work took a great stride. In the end of the eighteenth century the glass-makers of Venice had completely fallen from their former splendor.

Ritterich, trusting to this old renown, attempted to produce some eyes at Venice. "The eyes that I have had sent from Venice," said he, "are of glass, and are for use only in wax figures. However, one of my patients reported to me a successfully made copy, but he died suddenly before giving me the address of the manufacturer."

In 1770 eyes were still made of glass. "Artificial eyes are made of painted glass" (Gendron: *Traité des maladies des yeux*, Paris, 1770).

Meanwhile, Sarck invented porcelain eyes, which were clumsy and inconvenient.

The manufacture of eyes of enamel seems to have arisen in the second half of the last century, but we do not know to whom belongs the honor of this improvement.

In 1818 Hazard-Mirault published his practical treatise on the artificial eye.

One should not exaggerate the importance of this work. From a scientific point of view, he simply translated and reproduced the essay of Mauchart.

"It was this great artist who first succeeded in making eyes of enamel, imitating nature so perfectly that often it was impossible to distinguish the artificial from the natural eye." It is thus that Gaugot and Spillmann express themselves in regard to Hazard-Mirault. It is exaggeration. Ritterich had in his possession eyes which had been given him by Hazard the elder; he compared them to those of other manufacturers without recognizing any superiority in the former.

Hazard-Mirault must have been the first to make a transparent cornea separated by an anterior chamber from the iris located 3 millimetres posteriorly (Gaugot and Spillmann).

I believe that we must deny to Hazard-Mirault the honor of this discovery, and I base my assertion on the following: "Ritterich gives as the medium thickness of the eyes of Hazard and Desjardin a quarter of a line for the conjunctiva, a line and a half for the centre, where the cornea and the iris are represented. Now the dimensions of the eyes that Mauchart had in his possession are a half-line, and a line and a half for the thickness of the cornea and iris." I do not see, therefore, what improvement was introduced by Hazard-Mirault.

As regards resemblance, the glass eyes of the seventeenth century had arrived at a degree of perfection unsurpassed by our eyes of enamel.

Render unto Cæsar the things that are Cæsar's. The treatise of Hazard-Mirault is an excellent work, but possessing little originality. Hazard had especially the merit of perfecting the material side of the manufacture of the artificial eye. He shared this honor with Desjardin père.

Desjardin fils, in his thesis (*Essai sur l'hydopisie suivi de reflexions sur l'ophtalmoplastie*. Paris, 1837), devotes some pages to the memory of the work of his father, which he afflicts with the barbarous name of Ophthalmoplasty. Custom has not preserved this scientific *word*.

After Hazard-Mirault we enter the contemporaneous period where we take up the works of Boissonneau (1848), more commercial than scientific.

We must still mention a monograph of Abbas, published in London in 1844, which we have not been able to procure. It is reviewed in *Annales d'Oculistique.*

Finally, we must give the place of honor to the treatise of Ritterich, already cited, to which we have had frequent recourse in our historic study. This author attempted, about 1850, to introduce into Germany the manufacture of enamel eyes, and it is known, besides, that the German manufacture tends more and more to supplant the French industry in this respect. Even the artificial eyes sold in France are in part actually supplied by Germany.

A STUDY OF ACUTE PURULENT INTERSTITIAL KERATITIS.

By Dr. **Du GOURLAY** (of Dinard).

Purulent keratitis is very common in the departments of Ille-et-Vilaine and Côtes-du-Nord, and compromises each year a great number of eyes in this region. If trachoma is here almost unknown and purulent ophthalmia is rare, malignant purulent keratitis amply replaces them as an element of destruction; so, in affirming that it alone causes the destruction of a quarter of the eyes lost in our region, I think I am not departing from the truth.

It seems to me, further, that this disease takes a severe form in our provinces more frequently than is ordinarily encountered, and that it assumes a special type; and it is therefore my wish to record the symptoms which I have observed.

The onset is always abrupt; it follows very closely upon the immediate cause ascribed by the patient; this cause is invariably an injury or the entrance of a particle of dust between the lids. The bulbar conjunctiva becomes injected very shortly with a vivid redness (this is the first symptom that the patient notices); the corneal margin is covered with a fine vascular network, more apparent and more dense in that portion of the cornea where the inflammatory process is imminent, if it has not already appeared. Presently the conjunctival injection rapidly increases; on the third or fourth day after its appearance, although the central spot is as yet scarcely visible to the naked eye, an idea of the extreme acuteness of this affection may be acquired from the intensity of the photophobia and lachrymation. The least ray of light causes an abundant flow of tears and brings on a violent spasm of the orbicularis. Vision, which is at first disturbed only by the tears and photophobia, becomes more and more confused, even though the corneal nucleus is no larger than the head of a pin. The seat of the inflammation can, however, be easily distinguished, which is invariably in the centre of the proper corneal tissue, leaving perfectly transparent the epithelium and Bowman's membrane.

In some cases I have been able to see, three days after the appearance of the conjunctival redness, what I call the product of inflammation, as large as the head of a pin. It is easily visible between the lamellæ, presenting its usual characteristics: of a yellowish gray color, strongly reflecting the light, encircled by a gray halo, shading off insensibly into the surrounding healthy tissue. It is always in this way that I have observed this diseased nucleus make its appearance, and that I have watched it increase with most alarming rapidity. Very rarely multiple foci are observed, in which case they are very near each other and soon fuse into a single focus. Invariably, also, it is toward the anterior chamber that the destruction of the corneal elements proceeds. Soon the membrane of Descemet is forced in by this compact fibrinous mass, which I cannot refrain from comparing to the core of a furuncle. Owing to its elasticity and resistance, this membrane, which seems to serve as the envelope of the new growth, forms a hernia in the anterior chamber, opposing for a longer or a shorter time the entrance of the diseased mass into the lower portion of this cavity.

I have said that the epithelium and the anterior lamella are not at first altered; the vitality of these membranes is not really affected until the deposit has fallen into the anterior chamber. They become infiltrated, however, and lose their transparency; they may even become necrotic, making in this way an open breach for the exit of the lens, a complication which exposes the deep parts of the eye to an infection capable of inducing a panophthalmitis. Fortunately, however, this is not always the case; the exudation is often seen to be limited; the anterior membranes, although altered, forming a barrier sufficient, if not to hinder the escape of the aqueous humor, at least to oppose the exit of the lens.

The phenomena in connection with the iris also assume a serious character: the pupil is seen to dilate, is clogged with plastic matter, and becomes totally insensible to atropine. The detachment of the plastic mass is then imminent, and very soon, by virtue of the law of gravitation, it will have gained the lower part of the anterior chamber, simulating an hypopyon, for which it has certainly been mistaken.

The principal subjective symptom of this disease is pain; at first local, and compared by the patient to a feeling of dirt in the eye, it rapidly extends to the forehead and temples, and sometimes even to the face and the entire corresponding side of the head. Every day it becomes more intense, until the moment when the aqueous humor can escape through an incision or a spontaneous opening.

The photophobia is of the most pronounced type, and the lachrymation is constant; the tears are burning, very acid, and easily produce small excoriations of the skin of the lids, which increase the suffering still more.

In a more advanced stage the conjunctival secretion may become thickened, and may present at times a certain amount of purulence. Indeed, the violence of the various symptoms should be taken into serious consideration in establishing a diagnosis. They foretell that the small corneal blemish, which is about to be found between the lamellæ, is to become in its growth a destructive element of the most formidable character.

The progress of the typical form of the disease is, like its onset, most acute and rapid.

We have seen above that the appearance of exudation may occur three days after the exciting cause; that five days after this it may involve a quarter of the cornea, form a hernia into the anterior chamber, and a short time after break into this cavity. In all, about ten days suffice for the morbid process to complete the first three stages of its evolution; in the less severe cases, fifteen days are necessary for it to reach this point. It would be fastidious and without interest at that stage for the practitioner to estimate the necessary time to effect destruction, or to bring on the graver complications, since all hope of a return of vision is then lost. All our attention should be concentrated on the other stages, which give at least a faint hope. It is well to know that the progress of the disease may not go beyond the first stage. Although I have never been able to witness it without energetic intervention, it may be supposed that after a longer or shorter period the nucleus may be reabsorbed, but not without leaving visible traces of its passage. It is then always a steady progression which must be assisted; so one should not wait to see the exudate make its appearance in the anterior chamber, but shortly after the onset assist its fall into this cavity. When once the fibrinous mass is detached from the cornea it may be spontaneously expelled through an opening in this membrane on about the eighth day.

In the more serious cases, fortunately rare, the escape of the lens is not long delayed, a precursory sign of a general infection of the organ which leads to panophthalmitis.

The period of repair follows closely on the spontaneous or provoked expulsion of the exudate. Between the reabsorption of this product and the total loss of the eye there is a large class of cases terminating by a flat cicatrix adherent to the iris. The pupil is then obstructed by plastic masses when it is not covered by the cicatrix. In spite of this, in one or two months the anterior chamber is in part restored, which allows a hope of some return of vision. Although this result seems meagre, it should never be underestimated, especially if the patient has already lost one eye. Many are the unfortunates to whom, in similar circumstances, I have been able to give enough sight to resume their calling, or at least to guide themselves without the aid of others. It is useless to dwell upon the gravity of the prognosis; it is always serious, while in the most favorable cases an indelible opacity remains in the cornea which, depending on its position, may more or less considerably diminish the visual acuity.

The general condition, constitution, and age of the patient should be taken into consideration in giving an opinion on the final issue.

But before expressing an opinion a thorough examination of the lids and lachrymal ducts should be made. Patients with a drooping of the lower lid following blepharitis and lachrymal troubles inspire greater apprehension than others with comparatively healthy lids.

Other things being equal, however, the position of the exudation should also be seriously considered. Indeed, the result of my observations has been that all infiltrations situated below the transverse diameter of the cornea are less to be feared than those above. I have observed numerous cases who did not come under my care until the last stage, who nevertheless retained the upper portion of the cornea perfectly transparent. The exudate was attached to the altered portion, forming a hernia through the loss of substance of this membrane, and was easily extricated by means of forceps. After careful irrigation and proper attentions, the cicatrix has been formed under excellent conditions.

Far more serious is the prognosis of exudations situated in the upper portion. The result of observation is that in this region the infiltration spreads more rapidly and is less amenable to treatment.

Onyx or unguis and infectious ulcerating keratitis (serpiginous ulcer) are the affections which it is important to differentiate from that under discussion. In general, onyx (interlamellar suppurative keratitis) has an onset and course far less acute. The symptoms of pain and photophobia are far less accentuated. It occurs most frequently in young scrofulous subjects, in contradistinction to acute interlamellar keratitis, which belongs solely to old age.

In short, unguis is composed of an actual collection of pus, more or less thick, but having neither the color nor the density of the coagulum above described. A true exudation of pus has no more tendency to open a passage for itself toward the epithelium than toward Descemet's membrane. When it pours into the anterior chamber it does so through a fistulous tract more or less visible, and accumulates at the bottom of the cavity to form a true hypopyon. It never appears under the form of a compact mass enveloped by the inner membrane, as in acute interlamellar keratitis.

Serpiginous ulcer, after having infected the anterior chamber, does certainly at times present the form of a more or less dense mass; but there is always fluid pus at the bottom of this mass which escapes with the aqueous humor, and the small coagulum which is found has no resemblance whatever to the compact mass, which is always removed intact, either with forceps or the knife, in cases of acute purulent interstitial keratitis.

Furthermore, in the beginning, confusion with the ulcer is impossible, as the latter always attacks the epithelium and anterior lamella.

Without doubt, there may be difficulty of diagnosis, and it frequently occurs at a more advanced stage, when, after perforation of the cornea, the anterior chamber is filled with a fibrinopurulent deposit. The density of the coagulum alone designates with which of the two affections one is dealing.

This form of keratitis is found solely in adults and old people. I have never seen it in children. The youngest of my patients was thirty years of age; but the greater number of those whose record I have preserved were over forty; they were nearly all laborers in the fields or sailors. About one-quarter of the cases were women, most of whom were peasant women more or less occupied on the farms.

The scrofulous diathesis or the lymphatic has seemed to me to be a predisposing cause; but the preponderance should be given to the various lesions of the lachrymal apparatus and chronic blepharitis, especially when the latter is accompanied by an ectropion, even though slight. There is assuredly a relation between this interstitial keratitis and blepharitis with misplacement or obstruction of the lachrymal openings, which is frequently seen on the Breton coast; for in eight cases out of ten that have come under my observation I have found a previous lesion of the lachrymal apparatus or the lids.

Among the exciting causes, I always find a direct injury to the globe, at the least the penetration of dust between the lids. The more acute cases seem to be produced by injury from a twig or beard of grain, or the entrance of the finely powdered particles prevalent in hay-lofts. I must also mention the injuries to the globe arising from the débris of brushwood, composed of spines, thorns, and briers, and from the fragments of stone which are broken for roads. All these objects can easily contain pathogenic germs capable of causing an infection in the eye.

In the absence of any precise means of histological analysis I cannot certify to the exact composition of this focus of disease which I have so often extracted either from the cornea or from the anterior chamber. Its physical character has already been described; it is always of a globular form, very compact and viscous. Its color varies between a dull gray and clear lemon yellow. Its size varies, according to the period of growth, from that of a grain of wheat to that of a pea. On microscopical examination (obj. 1, ocl. 1 Nachet), the mass appears to be almost entirely composed of fibrin, enveloping the corneal corpuscles, which are more or less recognizable; many of these corpuscles are altered by hypergenesis and fatty degeneration. On the border are found proliferating nuclei in abundance, and numerous leucocytes. Several attempts have been made in the laboratory to discover a special micro-organism which might be the cause of this disease. Up to the present time only bacteria which are already known have been found: the staphylococcus accompanied by the streptococcus, the latter particularly abundant. While awaiting further researches I may be allowed to attribute the malignity of this affection to the union of these two pathogenic microbes.

It seems logical to employ an antiphlogistic method against this affection, which assumes such an extremely acute character. But as the greater number of patients present themselves in an overworked condition, and enfeebled by suffering, it seems better to employ tonic and constitutional medication in the meantime, to diminish the excess of vascularity. I have continued, in spite of contra-indications, to give on the first days small amounts of calomel, powders of hydro-bromate of quinine (0.20), and small doses of amorphous aconitine. But the principal efforts should be directed to finding proper means to bring about a regeneration of the diseased tissue. In the first place, heat is employed in the form of a lotion or embrocation, either with aromatic infusion or the less irritating antiseptic liquids (hot boric acid solution). These lotions always give relief, but the patient prefers a warm, moist bandage.

In the initial stage, in order not to increase the irritation, I have employed a 3% solution of boric acid; but at a more advanced period, when the cornea has given way and the diseased mass has entered the anterior chamber, I have had recourse to a solution of sublimate (water, 1,000; sublimate, 0.25). Despite the painful sensation from this solution, I have not hesitated to use it, as it prevents the conjunctival secretion from becoming purulent.

After this lotion, repeated two or three times a day, I instil several drops of a collyrium of eserine, then, before replacing the bandage, I introduce between the lids ointment of yellow pyoctanine or aristol.

If there is iritis, or if the loss of substance in the cornea is not peripheral, I substitute sulphate of atropine or salicylate of eserine.

The surgical methods employed, according to the stage of the disease, are:

1st, grattage; 2d, cauterization; 3d, keratotomy with or without cauterization.

Grattage seems to be indicated in order to reach the diseased nucleus situated between the layers of the cornea. The first step of the operation is easily made with a small knife with slightly convex blade; the diseased product may also be removed with the same instrument, though it is more convenient to use, for this purpose, a small sharp curette.

The actual cautery is, however, more efficacious than curetting, as in this way the entire purulent focus can be destroyed. It results from what has already been said that this energetic and radical method should only be employed when the exudation is still confined between the layers of the cornea and before it projects in any way into the anterior chamber. Nevertheless, during this period the disease is always arrested if an opening is made into the anterior chamber by means of the galvano-cautery.

Keratotomy, which Sæmisch first applied to the treatment of serpiginous ulcer, is an heroic method which may be employed at any stage of the treatment.

It is a method which is less destructive to the cornea than the actual cautery, and which leaves slighter traces. Unfortunately, it does not always succeed, and then recourse must be had to the cautery.

If the surgeon hesitates, during the first period, in his choice between these two methods, he should always employ keratotomy when the exudate, in pressing upon the internal membrane, has extended toward the anterior chamber ; the indications for this are more pronounced if the purulent mass has already reached the lower part of the anterior chamber.

In cases where cauterization or incision is adopted the operation can be easily conducted without forceps or retractor, as the cornea from the onset has lost its keen sensibility. This should, in fact, be avoided, as the least pressure on the eyeball causes considerable suffering.

As far as possible, the puncture and the counter-puncture should be made in healthy tissue, which is easily done if the diseased portion is not too extensive; in the latter case, after the puncture the point of the blade is directed straight to the middle of the exudation, but the counter-puncture should be terminated at the limit of the diseased tissue. The incision thus made in healthy tissue often opposes an effective barrier to the disease; if this does not serve, after being well assured of a renewed invasion, the edges of the wound should be freely opened with the fine point of a galvano-cautery, and the anterior chamber should be washed out again, a procedure which I always adopt after a corneal incision, with a 1 to 2,000 solution of bichloride. If the fibrinous mass has fallen into the lower part of the anterior chamber, and it is not possible to remove it on the blade of the knife or by washing it out, it should without hesitation be seized by a small pair of forceps, with which it can be removed *en masse* by a single effort, without further damage, provided care is observed not to seize the iris.

Most frequently, cauterization after corneal incision definitely arrests the progress of the disease. In case it does not, nothing will succeed: the cornea, almost completely altered, will only form a large leucoma; it will be fortunate if the remains of this membrane are sufficiently resistant to prevent the formation of an irido-corneal staphyloma, which leads to a long course of suffering and danger for the patient. In spite of all precautions, the expulsion of the lens is sometimes brought about, and, as an almost certain consequence, panophthalmitis is induced of such a severe type that enucleation becomes necessary.

When the stage of repair begins, the attention and care of the physician should continue daily, if possible. In fact, the process of repair will be greatly influenced by the after treatment. If the loss of substance has been considerable, or if the epithelium or Bowman's membrane is infiltrated and fixed to the iris, a warm moist bandage should be applied day and night to prevent their separation, and this may be compressive or not, according to the indications.

Twice a day the bandage should be renewed and abundant irrigation employed with a warm aseptic or antiseptic liquid. The collyria or ointments before mentioned may be used if required.

It is of the greatest importance that the bandage should be worn for a long period, as a firm white scar is frequently obtained in this manner. If it is not worn for a sufficient length of time the patient is exposed to the danger of irido-corneal staphyloma. In my opinion, the bandage, which need not be moist and warm after the scar has commenced to form, should be worn for from six weeks to two months without interruption. The greatest service can be rendered to patients if, during this long period when they no longer suffer, the time can be improv to rectify, if they exist, any functional defects in the lachrym apparatus. The condition of the lids should also be attended t and the diseases or anomalies which may be present (blephariti ectropion) remedied.

Case I.—B—— H——, aged 46, a day-laborer at Saint Servai Acute malignant interstitial keratitis. Complete destruction of tl exudate by electrocauterization. Rapid recovery, with a slight no adherent scar.

Case II.—*P——, housewife at Pleugueneuc (Côtes du Nord), years of age. R. E. lost, L. E. malignant interstitial keratit Grattage and actual cautery. Aggravation. Keratotomy. Rec ery. Scar non-adherent.*

This case is interesting, as three days after the injury I was ab at the hospital at Dinard, to follow the development and progr of the disease. When she came to consult me at Dinan at the e of June, 1891, I had her come to Dinard, recognizing that the con tion was very serious. The diseased point, situated between the lay of the cornea at its upper and temporal portion, was the size of the he of a pin. Three days before, while cleaning a hay-loft, she had felt du enter between the lids. Marked bulbar redness. Fine pericorneal i jection. Severe frontal pains. Photophobia and intense lachryn tion. Medical treatment: Warm moist bandage. Grattage and ig puncture penetrating into the anterior chamber. Two days aft symptoms aggravated. The fibrinous mass had advanced into t aqueous humor. Keratotomy. The mass was half the size of pea, and adhered to the blade of the knife. Irrigation of the ant rior chamber with bichloride 1 to 2,000. Bandage. After recovery, observed that a non-adherent cicatrix had formed and that the ant rior chamber had been restored. A month later, the corneal cicatı was firm. No more lachrymation or sensitiveness. In Septemb the leucoma, though apparent, did not greatly disturb sight.

Temperament lymphatic. Lower lids thickened. Lachrym trouble for two years.

Case III.—Supero-internal keratitis. Antiseptic lotions. Relaps cauterization (thermocautery). Remission, then a new attac Escape of the lens. Panophthalmitis. Atrophy.

Case IV.—Superior keratitis. Keratotomy. Irrigation. Cicatrix adherent above. Six months later, anterior chamber restored below. Iridectomy with satisfactory result.

Case V.—L. E., keratitis situated at the lower portion of the cornea. Keratotomy. Irrigation. Recovery. Cicatrix non-adherent.

Case VI.—*Keratitis dating from fifteen days before. Lower portion of cornea involved. Extraction of the mass with forceps after enlarging the corneal opening. Leucoma flat and adherent below. Pupil free. Upper portion of the cornea transparent.*

P——, master of a coasting vessel, 65 years old (Saint Lunaire). Thirty years at sea, worn out, rheumatic. Misplacement of the lachrymal points. Received an injury from a blade of wheat on the right cornea in August, 1891. Came to consult me fifteen days afterward; the cornea was softened and perforated below. The exudate filled half the anterior chamber. In enlarging the corneal opening with scissors I extracted the mass with forceps. After irrigation with bichloride, a bandage was applied and renewed twice a day. One month later the cicatrix was completely formed; the upper half of the cornea was transparent, while the lower was leucomatose and flat.

Case VII.—B——, farmer at Plancoët, 65 years of age. Corneal effusion of fifteen days' duration; injury from a blade of wheat in August, 1891. R. E., infiltration occupying two-thirds of the superior diameter of the cornea; keratotomy; irrigation; application; symptoms aggravated; actual cautery; prevention of escape of lens. Leucoma nearly complete; six months later, iridectomy with small success.—L. E. lost a long time before.

Case VIII.—B——, 55 years of age, an old sailor. Lower lids deformed, slight ectropion. In May, 1890, received an injury on the left eye while cutting dried brushwood. Eight days later, I observed on the lower portion of the cornea an interlamellar exudation about the size of the head of a pin. Grattage and cauterization by means of a small thermocautery; escape of aqueous humor. Rapid improvement; one month later, several small synechia in the pupil; the corneal scar quite small, and interfering very little with vision.

Case IX.—P——, 65 years of age, farmer, is quite old and worn out. Lids red, eyes inflamed. Lachrymation. Consulted me to-long period when they no longer suffer, the time can be impr to rectify, if they exist, any functional defects in the lachr apparatus. The condition of the lids should also be attende and the diseases or anomalies which may be present (blepha ectropion) remedied.

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Case IX.—P——, 65 years of age, farmer, is quite old and worn out. Lids red, eyes inflamed. Lachrymation. Consulted me toward the end of April, 1887; gave as the cause of his trouble the entrance under the lids of a grain of dust from a hay-loft which he was cleaning. After fifteen days of suffering, I found that the usual mass had become detached from the lower portion of the cornea and filled the anterior chamber. Incision; extraction easy; antiseptic irrigation, bandage, and the usual treatment. One month later, cicatrix adherent and flat; upper portion of the cornea quite transparent, with corresponding restoration of the anterior chamber. Relapse in the same eye two years later, at harvest time. After twenty days, panophthalmitis so severe that, considering the prostration and fever of the patient, I enucleated the eye under chloroform.

Case X.—Mme. R——, widow, Saint Lunaire; 60 years of age; nervous temperament; slight lachrymal trouble in the left eye for six months. Occupation, farming. In August, 1892, after a day passed near a threshing machine, was seized with violent pain in the left eye. Three days afterwards, I could see very clearly, under the epithelium and Bowman's membrane, a nucleus of interlamellar keratitis as large as the head of a pin. As the patient refused to allow surgical interference, I instituted medical treatment: warm moist compress, collyrium, cocaine, and salicylate of eserine, ointment of yellow pyoctanin, calomel in large doses. For a week this treatment gave some relief to the pain and arrested further development for a time. In continuing this still further, recovery might have ensued; but, losing patience, the patient allowed me to make a small puncture. The inflammatory product was quite small, and came out fastened to the point of the knife. There was no irrigation of the anterior chamber, which I left open for several days; after the inflammatory phenomena had completely subsided I allowed the wound to close. Several weeks passed, and the eye was still somewhat sensitive, but recovery with a small, insignificant scar was certain.

CLINICAL NOTES.

VASCULARIZATION OF THE ANTERIOR SURFACE OF THE LENS IN CASE OF CHRONIC IRIDOCHOROIDITIS.

By Dr. **A. DARIER.**

Mlle. L——, 42 years of age, no hereditary history, no personal taint, apparently in very good health, never any uterine disturbance, menopause at 36 years, typhoid fever at 28. Some vague articular(?) pains.

1880, congestion(?) of the left eye, which disappeared under atropine in ten days.

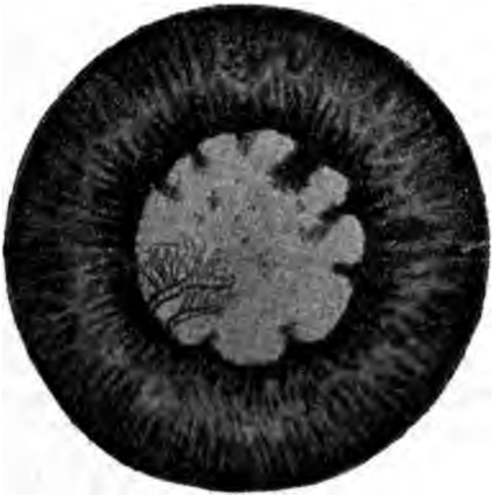
1891, another attack of short duration.

March 5, 1892, iritis with slight disturbance in the vitreous humor, which disappeared only after five months of mercurial inunctions.

In July, 1892, the right eye was in its turn attacked.

The patient was submitted to hypodermic injections of bichloride; after a series of sixty-six general injections and thirty sub-conjunctival injections, with periods of rest intervening, a marked state of amelioration was obtained. But each period of rest was followed by a renewed attack.

Salicylate of soda, pilocarpine, and iodide of potassium in large doses, were all without effect.



Iris and papillary space much enlarged; uveal deposits and synechia upon the lens, with many vessels and small hemorrhagic points upon the surface of the iris; and with fasciculi of vessels upon the anterior lens surface.

The disturbance in the vitreous humor only became more marked; the fundus of the left eye was seen with great difficulty, but presented no pathological change beyond the trouble in the papilla; no trace of central or peripheral choroidal spots.

The vitreous was clouded, and filled with scarcely movable floculi; the pupillary orifice dilated with difficulty, in spite of large doses of atropine and scopolamine.

Numerous uveal deposits and posterior synechia were seen at the centre and on the borders, which are represented in the annexed drawing by Dr. Barclay. At the lower internal portion of the pupil extending from the free border of the iris, or rather from its posterior surface, are seen four vascular branches, two arteries, and two veins, very distinctly ramifying in a fine network on the anterior surface of the lens.

The iris itself was infiltrated, thickened, œdematous, and slightly discolored. Vessels, new formations, and small hemorrhagic spots were seen on its surface.

R. E., iritis with posterior synechia, without disturbance of the vitreous humor.

It is of no avail to enter upon further details of this case, in which I wish merely to call attention to one peculiarity rarely observed. I at first supposed this vascularization to be corneal, but quickly recognized, in causing the patient to direct the eye up or down, that it was not displaced with the surface of the cornea, but always retained the same relations with the pupillary orifice and the border of the iris from which it seemed to extend. Its position was, then, on the anterior surface of the lens. The fact was too evident for discussion. There existed then an abnormal development of arterial and veinous vessels on the lower internal third of the anterior surface of the lens.

I have not been able to find an analogous case in ophthalmological literature; nevertheless, such cases may exist more frequently than is supposed, but pass unnoticed because examinations are not always made with sufficient illumination or with lenses of sufficient strength.

It was in the month of May, 1894, that I saw this vascularization, which I at first supposed had developed in the cornea itself, owing to its decided resemblance to those frequently observed in some forms of keratitis and almost invariably in interstitial keratitis. Hirschberg, who has made a special study of these latter cases, has described several in his *Centralblatt für Augenheilkunde*.

By employing, as he does, an ophthalmoscope provided with a lens of +20 to +30 diopters, I have been able with ease to study the actual conditions.

Are we to consider this vascularization as antecedent to an actual pathological process? May we suppose that we are dealing with the remnants of a pupillary membrane? I have searched ophthalmological literature without finding a similar case.

No records relating to the persistence of pupillary membranes bear any resemblance to the accompanying diagram. Nearly all the cases have been reported in literature associated with conjunctival extension or fibres traversing the pupil or inserted on the anterior surface of the lens, but in none was the presence of actual blood vessels mentioned without at the same time a number of fibres from the iris being inserted on the anterior surface of the lens. Nothing of the sort exists in this case.

How could this vascularization be produced? The patient has for years been subject to frequent attacks of iritis, which have left visible traces in numerous points of adhesion between the border of the iris and the lens, and uveal deposits are still seen extending to the centre of the pupil. The iris itself is infiltrated and œdematous, if I may use this term; its color is altered, and on examination with a strong lens various areas of abnormal and pathological vascularization, and even small hemorrhages, may be seen, which are easily distinguished in the diagram.

Is this vascular bouquet spread over the anterior surface of the lens simply a prolongation of the abnormally developed vessels on the surface of the iris? This dees not seem to be the case, as no continuation of the vessels which start from the border of the sphincter or the posterior surface of the iris can be seen.

It is probable that, before the time when the patient came under my observation, a pupillary exudate was formed which led up to the vascular network which is at present seen.

Is this form of iridochoroiditis with vascularization of the iris and the lens of frequent occurrence? For my part, it is the first case I have observed. No specific history could be obtained from the patient; she had none of the hereditary specific signs so well described by Hutchinson.

In the way of therapeutics, after considerable hesitation, I at last decided to perform an iridectomy, which seems up to the present time to have produced a beneficial result. The vessels have shrunken, and seem no longer to contain blood. The ocular media have slightly cleared, but the tension still remains sub-normal.

SEPTIC IRIDOCHOROIDITIS CONSECUTIVE TO A UTERINE HEMORRHAGE.

By Dr. **E. VALUDE.**

The case is that of a woman of about forty years of age who had had no disease of any sort and whose eyes had been perfectly good. Wednesday, November 7, while engaged in washing, she was taken with an abundant metrorrhœa, which obliged her to leave her work and quickly take to her bed. The physician called believed that he had to do with a miscarriage, and prescribed accordingly. The patient remained in bed, and the flow continued in diminished quantity during three days. The prostration was great and there was fever, but no signs of uterine inflammation or infection; there was neither pain nor excess of abdominal sensibility, and the discharge was without odor. During the progress of these phenomena, on the evening of Thursday, November 8, the patient was seized with pain in the left eye, and it was presently seen that the eye became swollen and red.

In a short time the ocular pains acquired a considerable intensity, and the swelling of the parts became extreme. There was conjunctival chemosis and exophthalmia. There was an absence of conjunctival secretion, a fact which opposed the hypothesis of an acute conjunctivitis.

At the same time the general condition of the patient took an unfavorable turn, the prostration becoming more extreme, and the patient complaining of continued nausea, which was at length succeeded by vomiting. There were no chills. At length the sanguineous flow was arrested and there was no further uterine trouble.

When I saw the patient she stated that she had been in a state of continual fever, had taken no nourishment, and that the attacks of nausea had been frequent; unfortunately, as I did not see her during the early period of the disease, I know nothing of the temperature at that time. Leeches applied to the forehead by the attending physician caused a slight diminution of the severe pains experienced by the patient. A few hours after the onset of the first ocular symptoms, vision was completely abolished in that eye.

I was not called to examine the patient until two days after the onset of the trouble, November 17. I saw that the eye was slightly prominent, but that it was mobile, and that the movements were painless, facts which excluded the hypothesis of an inflammatory or rheumatic affection of the orbit, such as phlegmon or tenonitis, which always induces an absolute or relative immobility of the organ. Furthermore, the appearance of the eye suggested an inflammation of the deep membranes: a chemotic swelling of suspicious aspect in the lower part of the conjunctiva; the iris dull, swollen, immovable, and projecting slightly forward; the anterior chamber diminished in depth and filled with a suspicious-looking fluid; and the pupil with a yellowish appearance, which left no doubt as to the condition of the vitreous humor. The latter was opaque and infiltrated with pus, if not transformed to a purulent mass. There was an extreme pericorneal congestion, which explained the violent cyclitic pains experienced by the patient. Further, the ciliary body was extremely sensitive to the touch, and the tension of the eye was somewhat increased.

Both the cornea and the conjunctiva were intact, and it was impossible to find the point of entrance of this infection, which menaced the integrity of the deep membranes of the eye. The patient had received no injury to the eye—at least, no evidence of this could be obtained.

The trouble was, in short, a purulent iridochoroiditis, a phlegmon of the eye in process of development. With the hope of alleviating the symptoms, I prescribed repeated applications of vesicants to the temple, inunctions of belladonna ointment, and laudanum poultices applied to the lids. At the same time tonic treatment was instituted to restore the forces of the tient.

On the 26th of November I saw the patient again in a l more satisfactory condition. The general health was impro and the eye was no longer painful. It was still red, howe but the pericorneal congestion was less marked. The pupi tained its yellowish appearance, and the vitreous humor was opaque. The tension of the eye was rather diminished.

The progress of the acute purulent iridochoroiditis had dently been arrested, and in spite of the intensity of the ir process, it was now certain that purulent destruction of the would not result. But the vitreous humor was so infiltr with leucocytes that it was hardly probable that it would (pletely recover its transparency. Vision was therefore com mised and the eye subjected to all the vicissitudes which fc an iridocyclitis of such severe form as this had been. So r for the prognosis.

The most interesting question is the cause of this iridoch ditis, which evidently was not of direct external origin, as cornea was perfectly intact. The infection of the deep n branes of the eye is closely connected, by relation of cause effect, to the metrorrhœa, possibly arising from a miscarri The prompt onset of the ocular disturbances the evening of day after the hemorrhage, and the absence of any uterine i tion, does not allow of the supposition of a septic inflamm developed in the uterus and transported to the eye by a cess of metastasis. I am more inclined to think that uterine mucous membrane, lacerated by the numerous vas ruptures brought on by the accident, was the door of entr of an infectious germ, which proceeded to develop in the o media, so well adapted to its propagation. The uterus, v serving as the door of entrance, remained free from infec Salo Cohn, in Germany, and Gendron, in France, have in (recent articles reported various observations relative to acci of this kind. My object has been to add a new fact to this egory, as the observation of such cases is still rare.

II.—REPORTS OF SOCIETIES.

OPHTHALMOLOGICAL SOCIETY OF PARIS.

Session of January 8th.

DR. VIGNES.—(*Referring to the proceedings of the former meeting*.—Discussion of the communication of Dr. Kalt on the treatment of purulent ophthalmia by irrigation. See *Annales d'Oculistique*, December, 1894.)

In the discussion on purulent ophthalmia I stated that perforated blepharostats do not effectually irrigate the conjunctival surface, as the conjunctiva presses against the orifices and easily obstructs them through the contraction of the orbicularis.

As I have not had occasion to employ the lid-elevator of Dr. Lagrange, I wish to say that since I have seen the figure of this instrument published in *Annales d'Oculistique* it seems to me that the defect which I have attributed to the perforated blepharostat does not apply to the instrument of our distinguished colleague.

New Phenic Preparations.

DR. GALEZOWSKI recommends phenate of mercury in diseases of the cornea, especially in herpetic phlyctenular keratitis. This preparation is an advantageous substitute for yellow ointment, which is at times irritating.

As a wash or instillation, the following solutions :

Distilled water...........100 grammes.
Phenate of mercury....... .0 gr. 010 milligr. to 0 gr. 047 milligr.

As an ointment :

Lanoline.................10 grammes.
Phenate of mercury.........0 gr. 05 centigr. to 0 gr. 10 centigr.

The author recommends the avoidance of cocaine in herpes of the cornea, inasmuch as this is an anæsthetic disease. The above preparations should not be used until steam douches or mydriatics have reduced the congestion ; they should, however, be discontinued if they are not well borne.

In addition to these external preparations, Dr. Galezowski ha also employed phenate of gold internally, in the form of hypodermi injections. This medication seems to produce good effects in opti atrophies. In tabes the atrophy is arrested under their influence an the shooting pains disappear.

However, further researches are necessary in this direction.

Dr. Dehenne.—I think that ointments and topical application should be avoided in all superficial affections of the cornea, excep atropine, which is to be used according to the indications. Me curial ointment in particular should be avoided. When I have o tained asepsis of the conjunctival sacs and nasal fossæ I practise o clusion of the eye, which has been so justly recommended by D Valude, and the phlyctenular keratitis improves rapidly. It i necessary, however, that the conjunctiva should be free from puru lent secretion.

Dr. Gorecki.—I take this occasion to draw your attention to th mercuric preparations which are useful in chronic cases. The pro erties of yellow oxide of mercury vary according to the method use in its preparation. Ordinarily a solution of sublimate is precip tated by a solution of caustic potash, so that according to the strengt of the solutions, the temperature, and the excess of one or the othe a precipitate is obtained varying from a canary yellow to a reddis yellow, whose density and molecular state vary according to th amount of oxidation.

In this last respect I have obtained the opinion of an emine chemist, who prepares aniline colors, and who has observed, as I hav the differences in the amount of oxidation.

Uniform products can, then, only be obtained by rigorously follo ing identical procedures.

I only speak, however, of preparations conscientiously made; thoug if ten prescriptions for yellow ointment be given to ten differe pharmacists, ten different medicines will be obtained. It is we understood that ointments made with an old preparation of oxide obtained by a dry method are totally different.

Dr. Vignes.—It is surprising that phenate of mercury should n be a local irritant to the eye, as subcutaneous injections of the sa are very painful, a fact which would lead one to suppose that would be irritating.

Dr. Galezowski.—I also think that occlusion of the eye is of a vantage in superficial keratitis, but the use of phenate of mercu allows me to obtain the necessary antisepsis.

Notes on the Construction of Contact Glasses.

Dr. Sulzer.—The principal difficulties encountered in the formation of these glasses arise from certain exigencies, which are :

1st. The necessity of adapting the curvature of the surface to the form of the sclerotic in different patients.

2d. The absolute precision of these surfaces, which should allow of clear vision in spite of the curves of short radius.

3d. The perfect freedom from irritation by the borders of the scleral portion, which should be, for this reason, perfectly smooth and polished.

It would at first appear that the best method of obtaining such glasses would be by the method of blowing, and that the necessary lightness and thinness could not be better realized than by the aid of the enameller's lamp.

However, all practical attempts in this direction have proved ineffectual. Either the surfaces obtained from the lamp are not perfectly curved, or the material is soiled by spots and impurities which disturb vision. In short, the various portions have different densities, and therefore the indices of refraction are correspondingly different. The rapid tempering, which is brought on by cooling, establishes in the piece subjected to blowing that peculiar molecular state characteristic of Prince Rupert's drops. Hence, the danger to the eye is the greater, since the rupture of the glass might happen very inopportunely, causing much trouble.

In applying to contact glasses the usual methods employed in shaping optical surfaces great difficulties will be encountered. Here it is not a simple spherical surface, but two surfaces cutting each other in their common diameter.

Futhermore, it is necessary to adapt the central cup to the scleral rim by a slight modification of the exterior spherical curvature. In short, it is necessary to give different radii of curvature to the internal and external surfaces.

To obtain homogeneous material and a state of equilibrium which despite the elasticity of the glass will not permit of possible changes of form, it has seemed best to take the piece from a cubical mass of glass carefully chosen.

The greatest difficulty is encountered in forming the central cup.

The successive stages of polishing should not be performed in crossed directions, but only in a direction following the common diameter of the surfaces bordering on the pole of the central cup. This simple suggestion will suggest the peculiar method of polishing which has been adopted by the excellent workman who is charg with this task ; but the difficulties in its execution will also be su gested.

When the glass has been formed and polished certain special fe ures must be added (see these *Annales*, Vol. CX., p. 335), in t form of one or more gutters in the scleral rim to allow the exit tears or air bubbles. Here again practical difficulties are numero but as they are not properly connected with the refraction of t system I will not lay stress upon them here.

The last difficulty which is connected with the form of the extre border of the piece is not the least, as the defects of the edges oft render it impossible to wear the glass; this difficulty has been ov come by the optician Séguy, and MM. Benoist and Berthiot ha been able to construct glasses, after these suggestions, without t earlier defects.

The new process consists in heating the glass shell in ovens of su cessively higher temperature and then subjecting it to the flame an enameller's lamp, maintaining the same temperature as the l oven until it is softened but not melted by the heat. A support asbestos prevents contact of the glass with a cold utensil, by which would be cracked. In this manner the regular form is maintained

I take the opportunity to express my warmest thanks to the hou of Benoist, Berthiot & Co., as well as to M. Séguy, who have greatly aided in solving this problem.

Optic Neuritis Following Ozæna.

DR. SULZER.—(*See the article in full in this number.*)

Dr. Chevallereau.—These phenomena of the visual field, hem nopia and scotoma, are not common in affections of the optic ne itself, in neuritis. Is this not a disturbance of the cerebral cir lation rather than an actual neuritis?

Dr. Meyer.—The facts described by Dr. Sulzer greatly resem the amaurosis and optic atrophy described by Ziem in disturban of the nasal fossae. Dr. E. Berger has also called attention to su cases. Still, what is most astonishing in these cases is the rapid of recovery.

Dr. Koenig.—I think, with Dr. Chevallereau, that this sho be considered as a disturbance of the cerebral circulation rather th as a neuritis. In a local disturbance, such as neuritis, I do not how such marked divisions of the visual field could be produced have been described.

Dr. Vignes.—I do not think that the existence of scotomata excludes the idea of neuritis. I presented to the French Society of Ophthalmology a case of hereditary neuritis in which there were very characteristic scotomata.

Dr. Sulzer.—The facts to which Dr. Meyer calls attention have been carefully separated in my article in the observations which I have communicated. Optic neuritis following sinusitis, orbital cellulitis, and osseous troubles produced by a nasal operation is easily explained. No conclusion can be arrived at in the cases which I have had the honor to present to you except by means of an autopsy. The facts have been presented to my observation as I have stated them, and have seemed worthy of attention, and I read them without drawing a definite conclusion.

OPHTHALMOLOGICAL AND LARYNGOLOGICAL SOCIETY OF BORDEAUX, 1894.

Wounds of the Eye by Shot.

DR. BADAL.—Fifteen days ago, M. P—— was struck in the left eye by a small shot from the discharge of a gun thirty metres distant.

Almost immediately after the accident, sight was lost and the patient came to me.

The anterior chamber was filled with blood, the eye was very soft, and the outer portion of the cornea, about one millimetre from the limbus, in front of the external line, presented an irregular orifice, which was evidently the point of entrance of the shot. The eye was very painful, and the patient complained of all the symptoms of iridocyclitis.

Supposing that a foreign body was lodged in the eye and that it was a source of danger, I enucleated the eye. On opening it, I found the retina detached by an extensive hemorrhage situated between it and the choroid, and no trace whatever of the foreign body in the eye. But behind the equatorial portion of the sclera and externally, an orifice was found precisely similar to the first; this was the point of exit of the shot, which had crossed the sclera quite obliquely, from side to side.

On examining the choroid it was easily seen that the shot had penetrated to the ciliary region, and that it had destroyed a region of three millimetres in diameter; further, fifteen millimetres beyond was another perforation of the choroid, which was altered and adherent to the sclera at this point.

This is the second time that I have found such a wound of the eye from shot by which it has been traversed.

I am led to think that hereafter it will be best to wait and not enucleate an eye wounded under similar conditions; as the shot which is lodged in the orbit is in general very well borne and the eye preserves its form and gives no occasion for surgical interference.

Dr. Lagrange.—I have seen a patient with the same conditions as those described by Dr. Badal. A shot had penetrated the eye, and I proposed enucleation, which was refused. Some time after, I saw the patient again with the eye in very good condition. In the future I shall be more reserved and wait until enucleation is necessary.

Circumscribed Abscess of the Ciliary Process.

DR. FROMAGET.—R——, eighty years of age, came to the ophthalmological clinic of the *Faculté de médecine,* complaining of severe pains in the left eye.

About two months before, in shooting a gun, a piece of the cartridge perforated the cornea and produced inflammatory symptoms, which disappeared at the end of three weeks. The pain appeared again fifteen days ago, and became intolerable.

A linear cicatrix of the cornea was found, almost vertical, and situated on the median line a little towards the internal side.

The anterior chamber was half filled with pus; the iris was greatly changed and fastened to the lens by strong synechia, and in the pupillary field a purulent exudate prevented deeper examination. The conjunctiva was very much injected and slightly œdematous. The ciliary region was quite painful. In the presence of a commencing panophthalmitis, enucleation was proposed and performed by Professsor Badal. On examining the eye after removal, the following lesions were found:

The retina, detached in almost its entire extent, enclosed the vitreous humor quite fluid and abundant.

All the posterior portion of the choroid presented its normal appearance. It was neither thickened nor purulent. But in the anterior portion, towards the internal region of the ciliary process, interesting disturbances were found. Behind the lens, pressing back the vitreous humor, was found an abscess the size of a small nut.

Both the anterior and posterior surfaces of the lens were covered with pus. I opened the abscess, and found in the middle the portion of cartridge that had brought about the disturbance. It was rectangular in form, and measured three by four millimetres.

The lens, which I had expected to find injured, was intact, which gave proof of the direction in which the foreign body had entered the eye.

It had perforated the cornea from without inward, and from right to left in a very oblique direction ; afterwards it had torn the zonule of Zinn without touching the lens, and, at last, lodged in the ciliary region, where it was first encysted and had then brought about the phenomena of a limited suppurative cyclo-choroiditis.

It is quite certain that if enucleation had not been performed we would have been obliged later to treat a suppurative panophthalmitis.

Such circumscribed abscesses arising from foreign bodies are rare.

Blepharoplasty by Temporal and Frontal Flaps.

Dr. Badal.—A young patient was troubled from infancy with a cicatricial ectropion of both lids of the right eye. The ectropion was quite pronounced, and prevented complete closure of the eye, so that an ulcerative keratitis resulted from the lagophthalmos.

This cicatricial ectropion, following the burning of the face, dated from early childhood. Not only the lids were burned, but the skin of the frontal and temporal region.

By reason of the cicatricial state of the tissues surrounding the orbit, I made two cutaneous grafts for the superior and inferior ectropion, with flaps taken from the arm. Only one took effect, and that was quickly thrown off. A year later the patient returned to me in the same condition as before. Ten months ago, I attempted blepharoplasty for the upper lid with a flap taken from the forehead, the pedicle of which was situated at the root of the nose. The first operation was successful, and two months ago I made the attempt to restore the lower lid with a temporal flap, in spite of the cicatricial state of the tissues. The flap was 8 centimetres long by 1 centimetre wide, and was of the form of a lengthened S, in order to avoid too much torsion upon the pedicle.

This large flap, owing to its peculiar disposition, became firmly attached to the indurated surface, and success was complete.

It is far better to rely on autoplasty than on heteroplasty, even if the tissue used is slightly cicatricial.

A Case of Tetanus Following a Penetrating Wound of the Eye.

DRS. FROMAGET and CABANNES.—Mr. Emile——, nineteen years of age, tailor, entered the hospital the 7th of June last, during the service of Professor Badal, for an accident which had happened to the left eye, a wound from a spark from a blacksmith's anvil.

Immediately after the injury the patient suffered severe pain, the eye began to bleed copiously, and the sight was completely abolished on the injured side.

From the time of the injury, after proper preliminary attentions, the patient suffered little from his eye. Four days after the accident—that is, the 1st of June—the eye, almost entirely emptied by the injury, began to suppurate. During the four days that followed the accident the patient was put upon a milk diet, and did not resume solid food till the 1st of June. At that time he noticed difficulty in opening the mouth and in chewing. This increased on the following day, and the 5th of June—that is, eight days after the accident—the patient appeared at the clinic of Professor Badal, who admitted him for spasms of the face and ocular muscles.

When the patient was told to open the mouth the opening was at the most only one centimetre in width. The masseters were hard and contracted. The sterno-mastoids were tense and especially contracted in the sternal portion.

A most interesting fact was the fixation of the healthy eye, which the patient could not move in any direction—neither up nor down, outward nor inward.

The pupillary reflex was abolished, but the reflex of accommodation remained. The pupil was of normal size, and the amplitude of accommodation, as well as visual acuity, were normal.

The lids retained their movements.

The patient experienced no pain; there were no spasms, no partial or general convulsions, and no elevation of temperature.

On the 8th of June, the day after his entrance, the remaining portion of the injured eye was enucleated under chloroform without accident. The wound in the cornea and the sclerotic had divided the anterior segment of the eye into three irregular portions. The only noticeable point was the difficulty found in separating the eyeball which had formed adherences with the capsule of Tenon.

On the 9th, photophobia, myosis.

Despite all treatment and the slow progress of the trouble, the pa tient died on the 14th of June. At autopsy, twelve hours after death, nothing abnormal was found.

This case is interesting from two points of view.

It is very rare, in the first place, to find tetanus following wounds of the eye. On the other hand, contraction of all the motor muscles of the eye suggests the facial appearance of ophthalmoplegia. These symptoms are rarely noticed, and deserve more careful attention than they have received.

Phthisis of the Eye; Ossification of the Choroid; Sympathetic Disturbance.

Dr. Puech.—A young man came to consult me with trouble in his right eye, which had lasted for some time.

Vision, formerly normal, was reduced to 1-4. The pupillary reflex was abolished. Ophthalmoscopic examination not giving any clue to the symptoms, I examined the left eye, which had for a long time been reduced to a stump, and occupied the fundus of the orbit. Palpation of this stump was painful, and supposing that the symptoms were of sympathetic origin, I advised and performed enucleation of the stump.

Eight days after, the right eye had recovered the normal tone and the pupil reacted to light.

On opening the stump I found a very advanced centre of ossification in the choroid, and attribute to the presence of this foreign body in the stump the sympathetic symptoms mentioned.

Penetrating Wound of the Eye by an Awl.

Dr. Fromaget.—The patient was a shoemaker who received a penetrating wound in the external portion of the right cornea from an awl. Forty-eight hours afterward panophthalmitis set in. During the operation of enucleation a metallic body was noticed behind the tendon of the right externus, and on removal of the eye it was seen to be the end of the awl, which projected into the orbit a distance of one and a half centimetres, and the base of which was implanted in the sclerotic at the root of the ciliary process. In all probability the awl, after traversing the eye from side to side, came in contact with the osseous portion of the orbit and was broken off, thus forming at the same time an intra- and extra-ocular foreign body.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Session of December 13, 1894.

Five Cases of Plastic Cellulitis of the Orbit.

MR. LAWSON reported five cases of orbital cellulitis; in four there was no pus, and in one a small amount was formed towards the end of the process. Three of the patients died, the eye of the fourth was enucleated, and one recovered with quite imperfect vision. In one patient the lesions were bilateral. Four of the cases were met with in women, and the last was a young man.

In one case the orbital cellulitis was preceded by an acute tonsillitis; another came with the onset of a purulent eruption of the face, with elevated temperature and pains in the joints. The cause of the cellulitis was without doubt in all the cases a general infection, the origin of which in the female cases was evidently utero-vaginal.

Mr. Tweedy had been successful in one case. Sometimes orbital cellulitis can be traced to the treatment of the lachrymal canals, as one of his cases had followed cauterization of the nasal membrane, and another an operation on the lachrymal canal.

Mr. Bronner had also observed a case of cellulitis following nasal traumatism.

Mr. Critchett had seen dental lesions cause orbital cellulitis, and the latter trouble recovered after treatment of the teeth.

Hydatid Cyst of the Orbit.

MR. LAWFORD had removed a hydatid cyst of the right orbit in a young girl seventeen years of age. The tumor was accompanied with pain, with exophthalmos, a diminution in the amplitude of ocular movements, œdema of the lids, hyperæmia of the conjunctiva, and diminution of visual acuity. V=¼. The optic papilla was swollen, the retinal veins tortuous, and the retina showed several small hemorrhages. All these symptoms appeared within two months.

After the operation for removal of the cyst the parts resumed their normal position, and the only thing to be noticed was a divergent strabismus, due, without doubt, to a partial division of the right internus during the operation.

Osteoma of the Conjunctiva.

Mr. Hartridge had removed an osteoma of the conjunctiva in a child three months old which measured 12 x 6 millimetres.

It was composed of bone covered with periosteum, showing in one part a cellular structure, and in the other a bony consistence.

Mr. Argyll Robertson had seen a precisely similar case several years ago.

Formol as a Hardening Agent.

Mr. Marshall has used formol in 10% solutions for hardening the eyeball; after only twenty-four hours, it is possible to make sections. The eyeball seems to be in a fresh condition, the cornea and lens are transparent, and the iris normal. There is no change in blood or pus. The vitreous is unchanged, and both retina and choroid remain *in situ.*

Mr. Robertson had found formol an almost perfect agent for hardening purposes.

Mr. Juler was of the same opinion.

Mr. Lindsay Johnson had employed formol before Leber had recommended it in histology. It was superior to all substances formerly used. As it precipitates metallic solution, it might be of use in studying tissues.

Papillary Conjunctivitis.

Mr. Bronner reported a case of papillary conjunctivitis of the left eye due to the prolonged use of arsenic internally. Applications of sulphate of copper produced no effect in the lesion, although the discontinuance of the arsenical treatment, which was employed for a cutaneous eczema, brought about a diminution of the conjunctival productions.

MEDICAL AND SURGICAL SOCIETY OF BORDEAUX.

Session of November 30.

Monocular Dyplopia in Hysteria.

Dr. Lagrange reported a case of monocular diplopia in an hysterical child, twelve years old. This diplopia presented characteristics diametrically opposed to those assigned to it in the classics, especially by Charcot and Parinaud. According to these authors, a monocular diplopia in hysteria is always due to a spasm of the accommodation. Contraction of the ciliary muscle explains the double vision in every case. The case of Dr. Lagrange, however, was due to sensory phenomena of cerebral origin. Careful examination of the static and dynamic refraction revealed no anomalies, except an insignificant astigmatism (0.50), the correction of which had no influence on the diplopia. The patient recovered from the diplopia under the influence of hypnotic suggestion.

Dr. G. Martin.—I have had a case quite similar to that reported by my colleague, and have interpreted it quite differently. It is well known that hysterical patients are very much inclined to prevaricate to avoid going to school; to escape any work whatever, they imagine and simulate diseases of the most complex form. In cases of this kind, I have believed in simulation, and without denying the interest in my colleague's case, I would ask if some reservation should not be made in the statements of his patient.

Dr. Lagrange.—I know very well that hysterical patients lie with the greatest facility, and from the very first hour I was on my guard, as it is necessary to be in examining hysterical persons. I studied the patient every week for two months; I repeated the tests, increased the examination, and tried in every way to verify her assertions. Never did I find her at fault. The monocular diplopia is then quite as certain as that reported by Galezowski, Parinaud, etc., as my patient was examined with quite as much care and attention as those of these authors.

Furthermore, this young girl presented a typical form of hysteria, and complained of the classic symptoms relating to the color sense and the visual field with a precision, on her part, which could not have been calculated, owing to her age and isolation in the country, far from patients of her class. All her statements, from the commencement of the trouble to the end, including recovery from the diplopia, were perfectly correct.

Dr. Armaignac.—I should like to ask my colleague if in this case the diplopia disappeared when accommodation was paralyzed by means of atropine.

Dr. Lagrange.—The diplopia remained the same after the use of atropine and relaxation of accommodation.

Dr. Armaignac.—I conclude from this that the condition of refraction and accommodation had nothing to do with the symptom of diplopia, and that this could only be of sensory origin, concerning which our knowledge is only hypothetical.

Disturbances of vision in hysteria are numerous and varied.

Sessions of December 21 and 28, 1894.

Treatment of Certain Forms of Paralysis of the External Rectus Muscle.

DR. G. MARTIN read a report of four cases of paralysis of the external rectus treated uniformly with injections of sublimate, either in the temple or in the gluteal region, and which recovered rapidly, part after the eighth injection, the others after the fourteenth. Two of these paralyses were complete, and the other two incomplete. The first two were only of a few days' duration, the third of one month, and the fourth of three months' duration. The patients were neither tabetic nor syphilitic, but showed manifestations of rheumatism. The author is of the opinion (under reserve) that the sublimate acted for the most part as an anti-rheumatic agent; he also thinks that the form of disease presented by his four patients was not a real paralysis, although this was the only diagnosis which could be given in the existing state of science. They were not paralyses with anatomical lesions of the tissues, but disturbances more or less pronounced of the abducting function, brought on by the rheumatic taint.

Dr. Armaignac.—These cases seem to be related to peripheral paralyses *a frigore*, and I am quite surprised at the result produced by the injections, especially in two of the cases.

But it must be remembered that these paralyses nearly always recover without treatment, and numerous cases are necessary to establish with certainty the influence of the mercuric injections.

Injections could be tried in old cases of paralysis, and especially in amblyopic eyes. For my part, I shall only try it in a case where all other treatment has failed.

Dr. Lagrange.—I freely admit the influence of rheumatism in the etiology of paralytic strabismus, and such paralyses should be excluded from the general category. The majority of treatises advise this.

As for the recovery of the patients, there are two explanations to be considered.

First, recovery may have been the result of the spontaneous disappearance of the disease; second, it may have been due to the injections of sublimate—that is, to a specific action of mercury on rheumatism.

Two of the patients recovered in three or four months, and it is not rare to see paralyses *a frigore* recover without treatment. The other two recovered in fifteen days and three weeks. Analogous cases are not rare, and peripheral paralyses are frequently influenced by local remedies, and the reaction following the injections of mercury seems to me to be the cause of amelioration.

As for the anti-rheumatic action of sublimate, clinical and therapeutic history does not prove it.

While granting that mercury was indicated, I should have preferred the biniodide as an injection, as the injections of sublimate are quite painful.

Dr. Sous.—Sublimate is antiphlogistic as well as antisyphilitic. In cases of paralyses *a frigore,* sublimate can act as an agent to reduce inflammatory products, and reduces them very rapidly, more rapidly by the hypodermic method than in any other way. In this way I should explain the successful results obtained.

Dr. Martin.—In stating that recent authors are not inclined to admit rheumatic paralyses of the motor muscles of the eyes, I wish to call attention to the statement of Dr. Panas, who says that the rheumatic variety is related most frequently to obstinate forms of tabes as yet little studied.

As to knowing whether the recovery of my patients was spontaneous or due to the medication employed, the future will prove.

CONGRESS OF HUNGARIAN PHYSICIANS AND NATURALISTS.

Session of 1894.

Sub-conjunctival Injections of Sublimate in the Treatment of Granular Pannus.

DR. SIKLOSSY.—The author first reviews the work of those who have written on sub-conjunctival injections, from Rothmund, Secondi, and Darier, in particular, up to Deutschmann quite recently.

He recommends the use of sub-conjunctival injections in conjunctival infections, even though acute. He has used them with success in acute blennorrhœic conjunctivitis; but it is more particularly in trachomia that these injections seem to produce the best and quickest results, especially if pannus exist, even though the pannus be complicated by ulcerative lesions or an abscess of the cornea.

In the majority of cases of pannus, recovery was rapid, and after three or four injections, at intervals of two days, the vascularization disappeared, the cornea cleared up, and vision returned. The author exhibited several corroborative cases.

Dr. Siklossy advises that the technique of these injections be simplified. It is not necessary to hold the eye open with a retractor and to fix the eyeball with forceps; at least for this last purpose rubber-tipped forceps should be employed. A needle with a very short point should be used, so that it will not be deeply plunged under the conjunctival membrane.

The best strength of the solution is 1-1000 ; the conjunctiva should be anæsthetized with cocaine before the injection. These injections are not ordinarily accompanied by any inconvenience. It has been said that they are followed by an adhesion between the sclera and the conjunctiva, which appears under the form of a hard plate similar to those following episcleritis. This complication is rare. The author has only observed it twice in a total of 400 injections.

MEDICAL SOCIETY OF PARIS.

Session of November 10.

Burns of the Eye from Vapor of Ammonia.

Dr. Trousseau.—I recently had under my care a young girl of twelve years of age whose mother had caused her to inhale from a flask of ammonia for a considerable time, for the purpose of curing a cold in the head. She noticed at the time considerable smarting in the eyes, which commenced to lachrymate. That night she slept well, but on awaking could not open the lids, which were glued to each other by an abundant secretion. The morning after, she was brought to me. The lids were swollen, and the conjunctiva was not only injected, but œdematous, with an abundant muco-purulent secretion. The corneæ were intact. This condition lasted several days. Then, after applications of cool boric acid compresses, the organs assumed their usual aspect.

This is a grade a little more severe than the first grade of burns, which allows the *restitutio ad integrum* of the parts attached.

In what may be called the second degree, the symptoms are the same, but real scars of the conjunctiva are formed, and it is difficult or almost impossible to prevent a partial symblepharon, as was the case with a kitchen-maid who spilled a bottle of ammonia which she was using for some domestic purpose. This woman was ill for three weeks, and had a slight corneal halo, which disappeared, but there were conjunctival adhesions of very little importance.

The third case which I wish to report corresponds to the third degree of gaseous burns. It is much more serious, and the victim of the accident, despite the most careful attentions, can to-day barely go about unassisted. A young *valet de chambre,* who had spilled a flask of volatile alkali, was seized with violent symptoms of ocular irritation, but was not examined by me until six days after the accident, when the conjunctivæ were found of a violent red, œdematous, and secretive. The corneæ were intact, and I supposed the prognosis to be favorable, only laying stress on precautions to prevent conjunctival adhesions (frequent movements of the lids, introduction of vaseline into the sacs). I was disagreeably surprised, three days after the first visit, to find that the corneæ were inflamed. I prescribed atropine and hot water compresses, and the membranes regained enough transparency to reassure me. The condition of the conjunctiva became and remained quite satisfactory. Everything had apparently returned to the normal, when, about three weeks after the accident, the corneæ were again disturbed, became milky white, and sight was completely abolished; in short, after six months' treatment I managed to obtain slight transparency of the corneæ, and was enabled to make an iridectomy, which allowed the patient to walk with some difficulty without a guide.

I cannot be too emphatic on the gravity and insidious progress of these latter accidents. The prognosis, in cases of similar burns, should be reserved, and the tardy appearance of a corneal opacity suspected, which can appear with greater intensity after an apparent improvement. An eye may remain almost intact in appearance for several days while in reality it is seriously compromised.

The handling of liquid ammonia presents a danger so serious to the eyes that both physicians and the laity should be carefully warned. Burns from vapor of ammonia may lead to not only simple hyperæmia of the conjunctiva, but also to serious opacities of the cornea. Its progress is insidious, and the real gravity of the case cannot be determined till after several days of observation.

Dr. Abadie.—I have also had a very serious case of burning of the eyes by vapor of ammonia. It occurred in a factory for the manufacture of ice. A large pipe burst, and the vapor of ammonia escaped in clouds under heavy pressure. Two workmen were enveloped by it; one escaped immediately, the other remained several minutes in a fainting condition, exposed to the ammoniacal vapors. The first escaped with a slight corneal leucoma, while the eyes of the other, when I saw him several hours after the accident, resembled those of a cooked fish. The cornea was opaque, milky, and indistinguishable from the sclerotic. I saw that the destruction had been complete and immediate; but what was my astonishment, on examining him the day after, to find that the appearance of the eye was due to a false membrane which covered all the ocular surface, and which I was able to remove with forceps. Underneath, I found the corneæ apparently healthy. When this membranous structure was removed the man cried out with joy that he could see. But his joy was of short duration. A few days later, the lens commenced to swell and lose its transparency, and a double cataract similar to a traumatic cataract was formed, which it was necessary to extract. Vision was again restored, but little by little the bulbar conjunctiva, which had been destroyed by the chemical action of the ammonia, became transformed into cicatricial tissue. The corneæ lost their transparency, and in the end the man, despite all these experiences, became completely blind. These delayed disturbances following burns of the conjunctiva by bases or acids are very ably described by Desmarres, who puts us on our guard against the too favorable prognosis which one is inclined to give during the first days, and which the grave progress of the disease very soon contradicts.

ACADEMY OF SCIENCES.

(Paris.)

Session of December 26, 1894.

A New Entoptic Phenomenon.

Dr. S. Tchiriew.—I noticed for the first time, at the end of last May, a new entoptic phenomenon, which I continued to observe for a long time without being able to explain it by the peculiarities of the structure of the eye, and of which I give here a description :

The windows of my bedroom face the west. On awakening on a certain day in the month of May, between three and four o'clock in the morning, and looking at the white ceiling, which was feebly illuminated, I noticed that the entire space included in my vision was covered with a network of squares of quite regular form ; the lines of this network were quite distinct, while the spaces were less pronounced. If I regarded this network longer than was necessary for a single glance, it disappeared. If I closed the eyes, and a short time after again looked at the ceiling, I perceived again the network, which after being visible for several tenths of a second again disappeared.

On repeating the same experiment several times—that is to say, closing the eyes and then observing the ceiling—I obtained each time the same result. But as the experiment was continued the network became more and more indistinct, and finally disappeared entirely. I could close the eyes, and afterwards observe the ceiling without a return of the phenomenon.

In the month of June this phenomenon appeared to me about the same hour (between three and four o'clock in the morning). But the following months, July, August, and September, it appeared later, and in October it was not to be seen until between six and seven o'clock in the morning.

The result of measurement of these squares was that on the retina the sides were a little less than one millimetre in length.

To explain this phenomenon it must be admitted, from the fact that the outlines of the squares were more distinct than the spaces, that the perception on the retina was produced by the outlines ; and in considering that the external layer of the retina—that is to say, the layer of rods and cones—is the only one sensible to light, it should also be admitted that the perception was produced in this layer. In short, as these lines have the form of rectangular networks, it should also be admitted that in the anterior layers of the retina there exist figures having the same form and less than one millimetre square, and that the anterior layers of the retina perceive the illumination of these more easily than the others.

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SOCIETY OF DERMATOLOGY AND SYPHILOGRAPHY.

(PARIS.)

Session of November 15.

On Hereditary Ocular Syphilis.

DR. GALEZOWSKI.—A large number of congenital ocular affections should be referred to hereditary syphilis. To make a good diagnosis in this respect it is important to discover in the different congenital ocular troubles those which present the characteristic symptoms of syphilis. In my opinion, these congenital anomalies can be divided into four quite distinct groups:

(*a*) *Malformations of the protective organs of the eye, of the orbit, and of the lachrymal canals;* affections which are quite rare, and in which the syphilitic origin may be proved by the simultaneous existence of lesions in the choroid and in the iris. Osseous caries and dental anomalies point to the same origin.

(*b*) *Paralysis of the motor nerves of the eye, ptosis, nystagmus, etc.*—For this class of lesions, frequent in very young children, and which are of cerebral origin or consecutive to infectious fevers, traumatisms, etc., it is necessary, in the absence of well-defined symptoms, to search for traces of syphilis in the cerebro-spinal axis. Dr. Brissaud informs us that in cerebro-spinal syphilis, a slowly progressive disease of early infancy, there are found, among other lesions, ptosis or monocular nystagmus with diminution of the central visual acuity, convergent or divergent strabismus, etc. The same is true of spasmodic infantile hemiplegia, which commences with convulsions and leads to isolated paralyses of the different muscles, with spasms of the antagonists, intellectual troubles, etc.

(*c*) *Arrest of development, microphthalmia, astigmatism, etc.*—Arrest of development, which not infrequently occurs in the eyes of children, should be, in my opinion, referred to hereditary syphilis in a large proportion of cases. I had suspected this for a long time, but was not assured of it until, in several cases of this kind, I found, by the aid of the ophthalmoscope, the characteristic changes of syphilis in the choroid and the retina. But I have also noticed that astigmatism may be brought on by hereditary syphilis, as I have had occasion to prove in many cases.

(*d*) *Inflammatory changes of the external and internal membranes of the visual organ.*—No one doubts to-day that interstitial keratitis is due to hereditary syphilis. Various authors, Hutchinson and

Desmarres among others, long since demonstrated this. I have frequently seen keratitis complicated with retinitis pigmentosa, and in this connection I wish to draw attention to an etiological factor of great importance: In congenital retinitis pigmentosa—which is not, as has been incorrectly stated, the result of consanguinity of the parents, but the result of an hereditary specific affection—the patient should always be treated with mercurial inunctions, the same as in the case of an acquired syphilis.

Dr. A. Fournier stated that he had also noticed the frequency of strabismus and astigmatism in hereditary syphilis.

MEDICAL SOCIETY OF GENEVA.

Session of October 3.

Treatment of Keratoconus.

DR. HALTENHOFF reported a case of progressive keratoconus in a patient thirty years of age. The right eye could only count fingers at 1 metre, and the left at 1 1-2 metres, with no improvement by glasses. The summit of the cone, situated almost in the centre of the figure, presented a small elongated oval leucoma, about 1 1-2 millimetres for the left, 2 1-2 millimetres for the right. The intraocular tension, as is frequently found in such cases, was quite feeble (18° by the tonometer of Fick); pupillary contractions were normal.

Among the different methods of treatment (central excision followed by cauterization by nitric acid according to Graefe, central trepanning according to Bowman, eserine and sclerotomy according to De Wecker, etc., etc.), I decided to employ the simplest and least dangerous, which consists in performing a repeated superficial cauterization of the summit of the cone, with the view, as in the other methods, of bringing about a flattening by cicatricial contraction.

The right eye, the worst of the two, was touched five times in twenty-two days. I endeavored to produce either a small, rounded central scar or linear burns in short striæ radiating from the centre. Several times, on removing the bandage, I found, surrounding the cauterized region, a series of small folds of the epithelium, which seemed to indicate a contraction of the underlying corneal tissues. Improvement in the vision commenced after the second cauterization. At the fifth, the centre, which was very thin, was perforated, the chamber was emptied and required three days to become re-established. This accident, which several authors have produced intentionally, had no other inconvenience than to greatly frighten the patient and force him to remain in bed with the eyes bandaged.

At present the conicity is hardly recognizable. In observing the eyes from the side, the profile of the right cornea appears almost normal, while the left is distinctly prominent and cone-shaped. In spite of some increase in the central leucoma, caused by the cauterization, vision has increased to one-ninth without a glass, and one-seventh with a concave spherical glass of two dioptries, a visual acuity with which one is better satisfied the more he has operated for cataract, and which allows the patient to read very well—for example, signs on the other side of the street. The other eye, treated by the same method, is improving ; after three cauterizations, vision has increased to about one-seventh.

III.—REVIEWS OF OPHTHALMOLOGICAL JOURNALS.

Albrecht von Graefe's Archiv für Ophthalmologie.

Reviewed by Dr. Sulzer.

Vol. XL., No. 3.

I.—**Metastatic Purulent Ophthalmia; Its Causes and Its Prognosis,** by Dr. Axenfeld.

II.—**Germs of the Conjunctival Sac and the Value of Antiseptic Ocular Ointments,** by Dr. Bach.

The author has cultivated twenty-seven forms of micro-organisms, of which ten were pathogenic, for the cornea of a rabbit, and all of which were found in the conjunctival sac of man. They were nearly all common forms of germs which had fallen from the air into the sacs.

To establish the action of tears on germs, the author made cultures with a dilution of the different micro-organisms in tears. In the majority of cases the presence of tears diminished or destroyed the vitality of the germs. At the same time, this microbicidal action of tears is not constant, either because an increase of the germs takes place after a period of diminution or because this increase starts at the beginning of the experiment.

The physiological solution, distilled water and well water, moreover, act identically. Precipitation of the albuminoid substances in the tears only produces an insignificant diminution in their bactericidal power. Similar experiments in which the tears were replaced by the aqueous humor prove that this latter prevents only the development of the pyogenic staphylococcus. In the vitreous, this later micro-organism develops abundantly.

(The fact that cultures of different micro-organisms are destroyed in tears or a salt solution, especially if the introduction of particles of the original culture media is avoided, leads the author to attribute a bactericidal property to tears. In my opinion, the only conclusion which can be drawn from the author's experiment is that tears and the salt solution are media of insufficient nutrition.—SULZER.)

As a practical study, the author has counted the number of colonies obtained by a puncture by a platinum wire in the conjunctival sac, done before and after cleansing. The cleansing was done in part of the cases with solutions of sublimate, and in the other part with the physiological solution. The result was that cleansing with an indifferent solution produced a diminution of the germs in the cul-de-sac and the free borders in a greater number of cases than when an antiseptic solution was used. Under a dressing, increase of the microbe is more marked than without the dressing. A great number of micro-organisms may remain in the cul-de-sacs without influencing the recovery of operative wounds of the cornea and the sclerotic.

Special experiments were made to prove that the different ointments used in ophthalmology, such as ointment of yellow oxide, of sublimate, of sulphate of copper, of iodoform, and of boric acid, possess antiseptic qualities. With the exception of the last two, the experiments were made both "*in vitro*" and upon the living subject. It is often possible to sterilize the cul-de-sacs by the application of ointment.

III.—A Contribution to the Pathological Anatomy of Embolism of the Cerebral Artery, by Dr. WAGENMAN.

The eye examined by Dr. Wagenman was the seat of an embolism of the central artery, of cardiac origin, occurring one year before the death of the patient, a woman forty-five years of age. Microscopical examination of serial sections showed the anatomical base of a partial re-establishment of the circulation, which had been noticed for some time by the aid of the ophthalmoscope. The embolus was situated directly behind the lamina cribrosa. There remained, however, an interstice situated in part between the wall of the vessel and the embolus, and in part in the embolus itself. This interstice was lined in its entire length with endothelial cells. The author attributes the origin of this opening to a secondary dilatation of the vessel.

Secondary atrophy of the optic nerve had invaded the entire portion removed, which had been cut off quite near the chiasm. In the retina, the nerve fibres, and the ganglionic cells, the molecular layer and the granular layer were completely destroyed. In place of the internal granular layer was found a simple layer of granular form, composed of the nuclei of the granular layer. The fibres of this layer were sclerosed and contracted. The external layers of the retina were scarcely altered.

IV.—**Researches on the Existence of So-called Exterior Accommodation, Produced by Pressure of the Muscles**, by Dr. SATTLER.

Dr. Schneller has stated that the length of the axis of the eyeball sensibly increases in certain visual positions. This increase is shown by an augmentation of refraction independent of the curvature of the lens. The author has undertaken to test these assertions by taking all necessary precautions for the avoidance of error in the observations. He arrives at the conclusion that, contrary to the statements of Dr. Schneller, no alteration of refraction is produced in looking down and in convergence independent of interior accommodation.

V.—**Origin of Zonular Cataract**, by Dr. PETERS.

A discussion between the author, who explains the origin of nuclear and zonular cataracts by disease of the nucleus of the lens bringing on a shrinkage of its central portions (*vide* these *Annales*, Vol. CX., p. 61), and Dr. Schirmer, who considers zonular cataract as the remnant of a total cataract which existed during intra-uterine life, or during the first period of extra-uterine life (*vide* these *Annales*, Vol. CX., p. 306), has led to a third publication, in which the first-named author takes the same stand as in his previous work.

VI.—**On Cauterization of the Sclerotic**, by Dr. KUGEL.

In cases of infiltration or torpid ulcer of the cornea the author has obtained very satisfactory results from cauterization of the conjunctiva which covers the sclerotic. At the first sitting, the pencil of nitrate of silver is applied to a zone three millimetres in width, concentric to the cornea and near the limbus. If the reaction is not sufficient, the following cauterization should be more extensive, even to the cul-de-sac, if necessary. This application is followed by a marked and prompt vascularization of the diseased portions of the cornea.

IV.—BOOK NOTICES.

BOOKS AND THESES.

Traité élémentaire d'Ophtalmologie, by Drs. Nimier and Despagnet. (1 vol. of 950 pages, 432 *illust.* *Alcan*, éd. Paris, 1894.)

The authors have had the happy inspiration to suppress from their book all the bibliography which encumbers and obscures so many didactic treatises. This book, with a practical aim only, professes to reproduce the current ideas of oculists concerning diseases of the eye and their treatment, and succeeds admirably in doing it. It is not necessary to review one by one each of the chapters composing Drs. Nimier and Despagnet's book, which is divided, like all such treatises, into diseases of the conjunctiva, of the cornea, of the sclerotic, etc.

At the end of each chapter is found a paragraph devoted especially to operations on the ocular region treated of in the chapter, an arrangement which avoids much repetition.

The authors have given some prominence to the study of amblyopia dependent on lesion of the central nervous system. The chapter on hemianopia and the various scotomata shows careful research. The same and more might be said of the chapter on motor disturbances of the eye, symptomatic of brain lesion, and on the various ophthalmoplegias. This subject—still new, and certain points of which are still in discussion—is treated in this work with decided clearness.

The volume terminates with an exposition of the ministerial instructions relative to fitness for marine and army service.

We are indebted to Messrs. Nimier and Despagnet for a good work, which aims to present the condition of practical ophthalmology as it exists at the present time. It is a book which will be valuable not only to students, as the authors modestly state in their preface, but to practitioners desirous of information on a given question contained in a few concise and simple lines.—Valude.

Précis iconographique d'anatomie normale de l'œil, by Dr. ROCHON-DUVIGNEAUD. (*Société d'édit. scientifiques*, Paris, 1895.)

As its title indicates, this little book is not a treatise ; it does not contain didactic descriptions of the various anatomical points of the organ of vision. The author takes typical histological preparations, diagrams of which are given, and explains the details of these preparations.

Dr. Rochon-Duvigneaud first shows several diagrams of the optic nerve from different points of its course. Attention should be called to one point which the author has observed, namely : the small fibrous prolongations emerging from the papilla even when it is normal, and representing the remains of the embryonic pedicle of the vitreous. He concludes that the appearances which Dr. Masselon has described ophthalmoscopically under the name of *abnormal prolongations of the lamina cribrosa* are probably the same things—that is, remnants of the embryonic fibrous prolongations of the vitreous.

From the optic nerve Dr. Rochon-Duvigneaud passes to the study of the ciliary region, occupied in the lower vertebrates by a simple ligament, and in man by the muscle of accommodation. It is in following the progressive disappearance of the ligamentum pectinatum, and then the increasing importance of the ciliary muscle, that the transition from the inferior animal races to the primates, as the ape, and then to man himself, is observed.

It cannot be said that the ligamentum pectinatum is altogether replaced by the ciliary muscle, since vestiges of it are always found, although it may remain rudimentary. The ligamentum pectinatum diminishes in proportion to the development of the ciliary muscle. The ciliary muscle belongs to the choroid, and forms an additional organ in the higher species, when it exists.

In speaking of the ciliary processes, the author criticises the term ciliary gland, which has been applied to this region; it in no way resembles a gland, although its epithelial surface favors the production of a liquid and produces a true secretion.

The description of the choroid, of the iris, and of the iris angle will be read with interest. In speaking of the retina, the author refers to the work of Ramon y Cajal, who has studied it by Golgi's method.

The work is terminated by the exposition of a theory relative to the development of the eye and of the structure of the ocular globe in its normal state. He considers the eye as a cyst. The optic vesicle, in closing, forms, as is known, in its interior, an invagination of conjunctival tissue, which becomes the vitreous, and an invagination of epithelial tissue, which forms the lens. The pedicles of these two organs, at first strangulated, then cut off, leave the two parts in question, the vitreous and the lens, in the condition of free bodies in the ocular cavity. This process the author calls total encystment, with suppression of pedicles. The transparency of these two organs, and their susceptibility to infection, come from their defective blood supply, since diapedesis and absorption of pathological products is slow in the absence of blood vessels.

In short, the eye being considered as a cyst, is exposed, like any cyst, to retentions of fluids and distensions of its walls, especially when it is considered that this particular cyst contains a species of gland in its interior, a fact which explains the processes of glaucoma.—VALUDE.

Du formol en thérapeutique oculaire, by DR. OLIVIER.
(*Thesis at Bordeaux*, 1894.)

The author, after considering the bacteriological, chemical, and clinical history of formol, relates that he has studied this substance in the service of Professor Badal. Twenty patients with purulent ophthalmia were treated with formol, in only two of which it was unsuccessful.

In three cases of conjunctivitis absolute recovery followed in a very few days.

Four cases of suppurating dacryocystitis were cleared up.

It was used as a collyrium in the strength of 1-200, and as a lotion, 1-100 or 1-2000.

It does not produce erythema, conjunctival or palpebral ulcerations, or corneal lesions, and is, in short, an excellent ocular antiseptic.—DE BOURGON.

Obstetrical Asepsis and Antisepsis, by Dr. TARNIER.
(*Lectures reported by Dr. Potocki, Steinheil ed.*, Paris, 1894.)

In the very important volume of lectures by Professor Tarnier, the part which is of especial interest to us is that which relates to the prophylaxis of ophthalmia of the new-born and treatment of purulent ophthalmia. Dr. Tarnier discusses the history of the prophylactic method, which gives such good results at present in comparison to the grave statistics of a period not long passed. He uses in his practice insoufflations of iodoform powder, as recommended by Dr. Valude (1), and which produces results rather better than those obtained from nitrate of silver, used according to Crédé's method. Iodoform does not produce the inflammatory reaction which is noticed after the instillation of a 2% nitrate of silver solution.

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(1) *Annales d'Oculistique*, Aug., 1891.

In the treatment of ophthalmia he adopts the classical treatment of frequent irrigations, and especially cauterization twice a day with a 2% or 3% solution of nitrate of silver, according to the intensity of the ophthalmia. For irrigation, the aseptic solution of thebaic extract (water, 1,000 gram.; thebaic extract, 10 centigr.). This liquid relieves the pain and has a favorable action upon the suppuration.

Other washes, especially permanganate of potash, tried quite recently, since the publication of an article by Dr. Kalt, have given unsatisfactory results. Permanganate of potash, especially, has produced harmful effects, and should not be used.—VALUDE.

Rétine des vertebres, by Dr. RAMON Y CAJAL, translated by VON GREEFF.
(168 pages, 7 pl. *Wiesbaden*, J. F. Bergmann.)

After having seen the same diagrams of the structure of the retina reproduced in all the treatises which have appeared in the last twenty years, the author has undertaken anew this delicate and difficult subject, the histology of the nervous system. The merit of this new effort is due, in the first place, to Dr. Ramon y Cajal, Professor of Histology in the Faculty of Medicine of Madrid. Thanks to the enterprise of the well-known Wiesbaden publisher, Mr. J. F. Bergmann, the interesting results of these researches have been included in seven folio plates of superior execution, and are accompanied with 168 pages of text from the pen of Dr. Greeff. The text is sufficiently full to explain the results represented in the plates. We recommend this work to all who are interested in the histology of the nervous system.—SULZER.

Sub-conjunctival Injections of Common Salt and Their Therapeutic Effects in Destructive Forms of Keratitis, by Dr. ARNOLD MARTI.

(*Des injections sous-conjonctivales de sel de cuisine et de leur effet thérapeutique dans les kératites destructives. Thesis at Basle*, 1894.)

At the clinic of Professor Schiess, sub-conjunctival injections of sublimate have been in use since 1892, especially in keratitis; but serious difficulties have been found here as elsewhere in its use: at times, intolerable pain, and inflammation which may lead to necrosis of the conjunctiva, and which always results in obliteration of the sub-conjunctival space from extensive adhesions with the sclerotic, etc. Mellinger was able to reproduce these disturbances in rabbits, but with solutions of 1-4000, or of weaker strength, the inconveniences cease. So, quite as good results are obtained with small doses of these weak solutions as with those advised by Raymond, Secondi, Darier, etc. He concludes that the efficiency of the injections is due to the action of liquid injected into the lymphatic circulation rather than to the disinfective action of the sublimate. Experiments with weak sterilized solutions of NaCl confirm his hypothesis. For a year these injections, ordinarily about 2%, have completely replaced those of sublimate at the clinic at Basle. Their good effects have been particularly noticeable in the destructive forms of keratitis, of which Dr. Marti reports 25 cases : 3 cases of corneal infiltration (not ulcerated), 8 cases of ulcerated keratitis in persons of different ages, 5 cases of ulcerative keratitis with hypopyon, and 9 cases of progressive infectious ulcer with hypopyon (*ulcus serpens*), all in aged people.

For several years destructive forms of keratitis have been treated by disinfection, moist heat, to which has been added, in serious cases, linear cauterization of the conjunctiva, after the method of Professor Schiess. The results, already superior to those of the actual cautery and keratotomy for ulcus serpens, have been very much improved by the addition of sub-conjunctival injections of NaCl, including arrested development of the disease, more rapid absorption of the infiltrate and exudate, of the hypopyon in particular, accelerated epithelial regenerations, cicatrization more favorable, perforation far more rare, etc.

By comparing the results of these 25 cases with 129 reported in the thesis of Fisch on linear cauterization (Basle, 1884) the advantage is on the side of the salt sub-conjunctival injections. In one of the eyes, which was enucleated for glaucoma, some time after recovery from a corneal ulcer, it was found that the sub-conjunctival space where the injections had been made was intact.

The author explains the good effect of these injections by the extensive diffusion of liquid injected into the lymphatic cavities surrounding the eyeball (experiments of Staderini, Deutschmann, Mellinger), and by the absorption of harmful substances and the products of assimilation, and the separation of diseased portions carried along in the accelerated lymph current. Salt being hygroscopic, pumps, so to speak, the liquid from the cells and fibres of the neighboring tissues. Dr. Marti recalls the recent work of Heidenheim, showing that the formation of lymph in the circulation is very much increased by introducing sea salt into the blood current. The more active elimination of the elements of decomposition necessarily brings about a more active supply of new nutritive substances from the blood, which naturally results in a more rapid reformation of the changed tissues.

—HALTENHOFF.

The Use of Crude Petroleum in Conjunctivitis.

(*De l'emploi du pétrol brut dans les conjonctivites. Thesis, Paris*, 1894. By Dr. Dubar.)

The author presents a review of treatment of conjunctivitis with crude petroleum, introduced into ophthalmology by his preceptor, Dr. Trousseau. He applies it confidently, as recommended by the latter, to all forms of catarrhal conjunctivitis, diphtheritic conjunctivitis, and the acute reactionary forms of trachoma.—De Bourgon.

MEDICAL JOURNALS.

Several Cases of Scotoma, by Dr. de Schweinitz. (*Internat. Clinics*, Vol. III., 4th Series.)

The cases reported are as follows:

1. *Sub-acute* glaucoma with *semi-annular* scotoma.

2. *Interstitial neuritis* in a patient addicted to the use of alcohol and tobacco in excess, and who had had rheumatism and malaria, and possibly syphilis with *annular scotoma.*

3. Homonymous scotoma of the lower quadrant on the left; later, lateral hemianopsia on the right, followed by restoration of the right superior quadrant. Finally, the visual field resumed its normal limit, but retained a large annular scotoma.

4. Unilateral central scotoma in a patient subject to transient albuminuria, possibly from the influence of hysteria.—De Bourgon.

A Case of Retinitis Pigmentosa of Rapid Progress, by Dr. Dehogues. (*Revista de Ciencias Medicas*, 5 octobre, 1894, No. 19.)

The patient was a man forty-two years of age, in whom a retinitis pigmentosa was developed with extreme rapidity without being preceded by hemeralopia. The author thinks the disease was due to chronic alcoholism.—De Bourgon.

The Therapeutic Value of Sub-conjunctival Injections of Sublimate, by Dr. K. Rumszewicz. (*Przegl. Lek.*, 4, 5.)

Based upon his personal experiences, the author suggests the following as indications for the use of sub-conjunctival injections of sublimate:

1. Cases of accumulation of pus in the anterior chamber; although the author admits that in certain cases this treatment is ineffectual.

2. Cases of infected wounds of the eyeball; here sublimate acts in a prophylactic or therapeutic manner.
3. Severe and obstinate cases of iritis, especially those accompanied with hypopia.
4. Scleritis.
5. The Choroiditis and retinitis of myopia.—MUTERMILCH.

Pseudo-Gumma of the Iris of Traumatic Origin, by Dr. WICHERKIEWICZ. (*Nowiny Lek.*, 1, 1894.)

The author reports a case of granuloma of the iris seated at the pupillary border and caused by a foreign body. This tumor, which greatly resembled a gumma, disappeared rapidly without antisyphilitic treatment.—MUTERMILCH.

Sub-conjunctival Injections of Sublimate in Sympathetic Ophthalmia, by Dr. B. WICHERKIEWICZ.

The author describes two cases of sympathetic ophthalmia recovering after injections of sublimate. It is important to add that besides the injections enucleation of the eye primarily affected was performed in two cases, and that many other therapeutic methods were employed.—MUTERMILCH.

Does Hysterical Nystagmus Exist? By Dr. SABRAZES. (*Semaine Médic.*, Sept. 26, 1894.)
(*Existe-t-il un nystagmus hystérique?*)

Tremor of the eyeballs, or *nystagmus*, may be congenital or acquired. If *congenital*, it is combined with defective vision, infantile cataract, microphthalmia, coloboma of iris and choroid, ametropia, albinism, retinitis pigmentosa, or astigmatism.

If acquired, it depends upon either an ocular disease such as glaucoma, or, as it is seen in miners, upon spasmodic disturbances of the muscular system of the eye, from too great and too long sustained efforts of accommodation from defective illumination. It is not rare to see nystagmus appear in the course of some of the diseases of the nervous system, such as multiple sclerosis, the hereditary cerebellar ataxia, the ataxia of Friedreich, progressive muscular atrophy, syringomyelia, paralysis agitans, and epilepsy. Lesions of certain portions of the brain, the optic thalami, the cerebellum, and restiform bodies may also induce nystagmus.

But is acquired nystagmus, the diagnostic value of which I am about to sketch, always produced by a permanent organic lesion? May there not be cases in which the successive eliminations of the many causes cited to explain nystagmus lead the observer to suspect the possibility of a purely functional disturbance arising from hysterical phenomena ?

This is not the opinion of neurologists, and particularly of Charcot, who said in 1892, in the course of a lecture on multiple sclerosis and its ocular phenomena : "Nystagmus is never found in hysteria or in tabes."

But the existence of a single indisputable case, carefully observed, suffices to controvert this too strong assertion and to show that an hysterical nystagmus may really exist.

The author confirms his assertion by reporting a case of manifest hysteria where the nystagmus was independent of any lesion of the visual apparatus. Furthermore, hypnotic suggestion caused the disappearance of all symptoms of disease as soon as it was practised.

Nystagmus should not, then, be taken as an absolute proof of multiple sclerosis without considering the possibility of hysteria.—VALUDE.

A Case of Hordeolum Terminating in Death, by Dr. LESNIOWSKI. (*Gazeta Lekarska*, No. 18.)

The case reported by the author relates to a man twenty years old who had had a stye on the lower lid of the right eye for several days, and who was suddenly seized with a severe chill, followed immediately by a marked œdema of the forehead. The condition of the patient continued to grow worse, and he entered the *hôpital de l'Enfant-Jesus* during the service of Dr. Jawdynski, when quite an intense fever was found, with loss of consciousness ; the lids of the right eye, the forehead, and the root of the nose were œdematous, and the œdema spread to the left half of the cranium. The eyeball and conjunctiva showed no signs of trouble, râles were heard in the lungs, and the general bad condition of the patient increased. At the lower border of the right lid a small scar was seen, near the internal angle of the eye. After shaving the hair about the œdematous epicranial region deep red streaks were found corresponding to the course of the veins, forming a network at the top of the head. In several parts of this network softening and fluctuation were found, while in others the streaks felt like hard cords. This was, then, a phlebitis of the frontal veins, which had arisen from the seat of the stye and had spread to the cerebral sinuses and produced pyæmia.

Incisions made along all the dilated veins of the forehead and cranium gave issue to a yellow, thick, non-fetid pus, and the suppuration was found to have invaded the surrounding tissue as well as the vessels. All the wounds were carefully irrigated with a sublimate solution, and an antiseptic dressing applied, but the patient succumbed to the general weakness.

The autopsy confirmed the diagnosis made during life. Suppuration of the two cavernous sinuses was found, while the other cerebral sinuses contained liquid blood, a fact which showed the course of propagation of the pathological process to have been the ophthalmic vein, and not the veins of the cranium which communicate with the superficial sinuses. On removal of the eye the ophthalmic vein was seen to be completely filled with pus, and one of the suppurating veins could be traced to the root of the stye. The lungs contained several metastatic abscesses.

Pus obtained with proper precautions at the time of the operation produced cultures of yellow pyogenic staphylococcus. There was then no secondary infection. The same germ which is constantly found in abscesses in general, and especially in hordeolum, had caused the primary trouble (the hordeolum), and its consequence (phlebitis).

From the study of this case Dr. Lesniowski is led to affirm that any one with a trouble even so slight as a stye may be exposed to the most serious infectious complications.—*From Semaine Méd.*

A Case of Operation for Congenital Cataract, by Dr. Van den Bergh. (*La Presse méd. belge*, Oct. 28.)

The patient was a child four years of age with a complete congenital cataract with good projection. The mother also had a congenital cataract. Extraction was performed according to the simple linear method of Von Graefe, as there were calcareous deposits in the lens and a commencing absorption which rendered discision as well as aspiration improper. Indeed, according to the author, it is not always proper to rely upon aspiration in cataracts of infancy. A hard nucleus is frequently found when it is not expected, and complications may follow, the least of which is the ill success of the operation. The same is true of discision. Dr. Van den Bergh remembers an operation for discision attempted in his presence, and which could not be completed because of the hard condition of the lens. The needle dislocated the lens into the anterior chamber, and the child lost the eye. As the consistency of a cataract is never absolutely certain, it is better to have recourse to a process which offers security in all respects.

The operation was then performed according to the method of Von Graefe. A number of softened masses were extracted, and there remained in place a thick sac which it was impossible to tear. Dr. Van den Bergh then introduced a capsular forceps and drew out the whole capsular sac. The same manœuvre was successfully accomplished on both sides, not an easy thing when the iris is left intact. After the operation the pupils were round and quite black. Recovery followed without complications, and the child enjoys good vision.—VALUDE.

A Second (1) Case of Ocular Diphtheria Treated by Serotherapy, by Dr. H. COPPEZ. (*Journ. de méd. et de chir. de Bruxelles*, Nov. 24.)

A detailed description is given of this case to emphasize the special character of the stage of repair following the injection of serum.

The false membranes, says the author, disappear more or less rapidly and leave behind them healthy tissue. There is no period of suppuration or repair. The disease is cured at the outset. The disappearance of the false membranes takes place in inverse order to their appearance. "They seem to melt like a snowflake in a ray of sunlight," is the picturesque expression of Professor Coppez, or, in more scientific terms, they seem to disappear by a process similar to that by which they came.

It is superfluous to dwell longer on the important rôle played by serotherapy in the treatment of ocular diphtheria. Thanks to the injections of antitoxine, we are henceforth in a fair way to check the invading progress of pseudo-membranous exudates. Better still, the last two stages of the malady may be suppressed, with all the dangers that accompany them. In short, with this new treatment, when the false membrane has once disappeared the disease itself is conquered. If treatment is begun at the proper time it will not be forty-eight hours before all the menacing symptoms have disappeared, and the physician will be gratified by the rapid and complete recovery.—DASTOT.

Old Foreign Body in the Eye, by Dr. LAGRANGE.
(*Annales de la Policlinique de Bordeaux*, Nov.)

The author reports a case of a foreign body encapsulated in the ciliary region which remained in place for seven years without producing any sympathetic disturbance or local irritation. There was a total detachment of the retina, dating from the time of the acci-was found to have invaded the surrounding tissue as well as the vessels. All the wounds were carefully irrigated with a sublimate solution, and an antiseptic dressing applied, but the patient succumbed to the general weakness.

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Formol in Ophthalmology, by Dr. GUAITA.
(*Lo Sperimentale*, No. 33.)

The author refers to the article by Valude (1) in which he firs called the attention of oculists to formol and explained its specia properties. Its essential quality is to maintain the medium which contains it, even when in extremely minute quantity, indefinitel aseptic. The most convincing experiment cited by the author is th almost indefinite preservation of a piece of meat under a glass simpl exposed to the vapor of formol. Dr. Leber, probably influenced b this fact, made a happy application of it by using formol for th preservation of laboratory specimens, and his communications o the subject to the International Congress at Edinburgh, 1894, attracted much attention.

Dr. Guaita repeated the clinical experiments of Valude, whic he confirms in every point. The solution employed was 1-200 stronger solutions being irritating and decidedly painful. In suppurative keratitis, formol has given very good results, because of it remarkable power of diffusion. In trachoma, this substance i shown to have a curative action quite superior to sublimate in rapidity and efficiency.

In brief, according to the author, formol is a substance whos sterilizing action is of much interest, and its use in ophthalmolog should be extended.—VALUDE.

Bi-focal Glasses, by Dr. AUBERT.
(*Lyon méd.* Dec. 2.)

The author states that bi-focal glasses should be more commonl used than they are, as for near vision a very small surface of gla only (1 centimetre) is required; the remainder of the glass is sui able for distant seeing.—VALUDE.

Sensory Disturbances of the Eyeball and its Adnexa i Locomotor Ataxia, by Dr. E. BERGER.
(*La Médecine moderne*, Nov. 21.)

Since Dr. Knies, in his treatise on the relations between gener diseases and ocular disturbances, drew attention to sensory disturl ances of the eyeball and its adnexa, observations in this direction have become more and more numerous. Dr. Berger here reports five new cases, from which he draws the following conclusions:

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(1) *Annales d'Oculistique*, July, 1893, p. 19.

I have observed that in locomotor ataxia quite varied sensory disturbances may develop in the eyeball and its adnexa.

In the cornea this disturbance consists of diminished sensitiveness of this membrane, touch producing no lid reflex. There is, besides, a false localization of sensation. Touching this membrane is localized in the corners of the eye.

In the conjunctiva I have noticed a partial anæsthesia to touch, and a false localization of sensation.

The skin of the lids also shows symptoms of false localization.

There may be a periorbital anæsthesia and false localization of sensations in the skin of the forehead, the temple, the cheek, and the nose.

Although my investigations of sensory disturbances of the organ of sight have not been extensive, I am inclined to think:

1. That there is no relation between their presence and that of an optic atrophy of ataxic origin. There are, indeed, cases of which I have had several convincing examples, in which there is optic atrophy of ataxic origin without sensory disturbances of the eyeball or its adnexa, and other cases where all these disturbances have been found in tabes and without optic atrophy.

2. I think that in a case of optic atrophy where sensory disturbances and false localization of sensation, such as I have described, are found, their presence is a strong presumption in favor of a tabetic origin of this atrophy.

It is superfluous to lay stress upon he importance, from a diagnostic standpoint, of investigating these sensory disturbances in dubious cases.—SULZER.

History of an Epidemic of Ophthalmology in a School, by Mr. SNELL.

(*Brit. Med. Jour.*, Nov. 17, 1894, p. 1104.)

Epidemics of ophthalmia have been observed in English schools frequented by children of the poor and the laboring classes.

But this is the first report of such an epidemic occurring in an institute well known in England as one where the hygienic conditions are of the best and the social position of the scholars leaves nothing to desire. The form of the disease was a benign follicular conjunctivitis. The first cases were sporadic, and gave no trace of the origi of the invasion. Teachers, as well as the scholars, were sufferers.

The follicles were found almost exclusively on the lower lid, rarel extending into the cul-de-sac. The upper lids were very rarely attacked. When this did happen the epithelial covering appeare roughened, as though scratched or covered with fine dust.

Of 102 persons connected with the school, examined at differen times, 13 only remained exempt. The servants who were employe in the dormitories were attacked, while those employed in th kitchen were not. Everything indicated that the infectious agen was localized in the dormitories.

The author proposed that the scholars should be sent back to thei families. Those affected with ophthalmia should take a certificat stating the condition of their eyes and that they should not be admitted into any educational institution before their complete recovery. Mr. Jonathan Hutchinson, who was also consulted, was of different opinion, fearing that the scholars would become centres o infection in their new surroundings. This view was adopted by th committee. Necessary measures were taken to isolate the patient in a house rented for this purpose and situated on the sea-shore The best results were obtained, but recovery was very slow. I spite of every attention, the disease continued for several months.

This epidemic presents several interesting points in the patholog of follicular conjunctivitis. All the cases recovered with no trace o a scar. No case degenerated into trachoma. More than half of th pupils affected were withdrawn from the school during the Christmas vacation (the epidemic had broken out in August) while th ophthalmia was still in progress. The author had the opportunit of following up many of the cases, and can affirm that not one o them communicated the disease to others. The most rigorou measures to remove the contagion from the institute itself were ineffectual. It seemed that the infectious agent came from the wall of the building, and that contagion played no part in the propagation of the disease.—SULZER.

Tabetic Amaurosis, by Dr. HUSEMANN.

(*Deutsche Med. Wochenschr.*, Oct. 25, 1894.)

For some time past there has been observed in Australia, in tha part of New South Wales traversed by the river Darling, an epizooti amaurosis among horses. The territory invaded by this diseas spreads more and more in a southern direction, and in some districts, especially in the neighborhood of Wilcannia and Wentworth, 25% of the horses are totally blind.

The disease manifests no inflammatory symptoms. Changes in the spinal cord and choking of the atrophied optic nerves are found.

The author shares the view of the Australian veterinaries, who attribute the disease to the toxic effects of Australian tobacco (*Nicotiana suaveolens*). This plant has spread for several years past in the districts ravaged by inundations.—SULZER.

Sub-conjunctival Injections of Sublimate, by Dr. GROSSMANN, (Budapest). (*Pester medic. chirurg. Presse*, 1894, Nos. 27 and 28.)

Dr. Grossmann is high in his praise of sub-conjunctival injections of mercury, performed according to the directions of Abadie and Darier. He describes a series of cases in detail in support of this form of medication, which he considers a great advance in ocular therapeutics. These injections have been employed without any serious complications in the following diseases:

1. Post-operative and traumatic infections.
2. Ulcerative keratitis.
3. Gummatous, granular, and rheumatic iritis.
4. Infectious iridochoroiditis.
5. Retrobulbar and infectious optic neuritis.
6. Optic neuritis of unknown origin.—SULZER.

Diphtheritic Conjunctivitis, by Dr. UHTHOFF. (*Berliner klin. Wochenschr.*, 1894, No. 34.)

Bacteriological examinations show that the gravity of pseudo-membranous conjunctivitis does not depend on the presence or absence of the bacillus of Klebs. This has been found in great abundance and in a virulent form in several cases of croupous conjunctivitis—that is, false membranes less exuberant than the diphtheritic membrane. As the result of his personal researches, the author is in complete accord with the conclusions of Sourdille and Morax.—SULZER.

V.—ITEMS.

Necrology.—Dr. Sichel, Jr., oculist, Paris.

Faculty of Medicine of Vienna.—Dr. Schnabel, professor in the German Faculty of Medicine in Prague, has been named as Professor of Ophthalmology in the place of Dr. Stellwag von Carion, retired on account of age.

MISCELLANY.

CORRESPONDENCE.

(Open letters to the Director of *Annales d'Oculistique.*)

CONCERNING THE TREATMENT OF PURULENT OPHTHALMIA.

MY DEAR COLLEAGUE :

In the discussion which took place at the Ophthalmological Society of Paris (see December number, p. 400) on the communication of Dr. Kalt concerning the *Treatment of Ophthalmia in the New-born,* I did not speak, through fear of not being able to express my thoughts without offence to my colleague. I did not criticise the quotation which he made from the thesis of my pupil, Dr. Morax, although it was not quite correct. Encouraged doubtless by my silence, Dr. Kalt now presents a new rendering, which quite misrepresents that paper. I find these words in the Proceedings, as reported in *Annales d'Oculistique,* December 1894, p. 416 : "I have stated that it has not been the custom with us to publish statistics of corneal complications. It is only that here and there a *serious failure* is noted, attributed to some entirely different reason. Morax, in his thesis written under the direction of Dr. Parinaud, cites two cases of ophthalmia following vulvitis, in two young women treated from the first twenty-four hours. In one case there was perforation, and in the other corneal infiltration."

There were not two cases of ophthalmia following vulvitis described in Dr. Morax's thesis, but six.

In one case (Case XVI.) there was indeed perforation. But it is important to know that *corneal lesions existed before treatment,* and that, in spite of a peripheral perforation of the cornea, the eye was preserved with good vision. It was also stated in the report of this case that there had been a traumatism of the eye, and that in putting the hand to the eye after the traumatism the patient, subject to vulvitis, probably brought about the contagion. I think that my experienced colleagues will find that this so-called failure was, in fact, a success.

In the second case (Case XVII.) it is stated:

"On July 25 a slight corneal infiltration appeared, but disappeared rapidly under treatment. August 1, recovery was complete, and there remained no ocular lesion."

These are what Dr. Kalt quotes as *serious failures!* Furthermore, it is not proper, in considering the gravity of these cases, to compare ophthalmia following vulvitis with ophthalmia of the new-born.

DR. PARINAUD.

THE EDITOR-IN-CHIEF.

DEAR SIR:—Will you kindly insert in your next number several observations on the subject of the treatment of purulent ophthalmia by irrigation? (Dr. Kalt's communication. See above.)

I am surprised to find that Dr. Kalt considers himself the first person in France to recommend the substitution of antiseptic irrigations for cauterization of the conjunctiva in purulent ophthalmia. It is well known that this was the practice of Chassaignac.

Some time ago I endeavored to discover a form of treatment for ophthalmia more simple and efficacious than the use of nitrate of silver. The results of my investigations were consigned to a little pamphlet which appeared at the beginning of last year. (Traitement de la blennorrhagie par l'irrigation antiseptique discontinue, *Rueff édit.*, Paris, 1894.)

I finally adopted, for the conjunctiva, the practice of intermittent irrigations with weak non-irritating antiseptic solutions. The success of such injections, whatever was the antiseptic used, has been noticeable in urethral blennorrhœa, provided the antiseptic was used in a solution weak enough to avoid painful reaction. Sublimate in a solution of 1-30,000 to 1-10,000 produces marked results in the urethra. In 1882 and 1883 I employed irrigations of permanganate of potash for the urethra and bladder, but have abandoned permanganate for sublimate, which gives, in solution of proper strength, quite as rapid results, and has not the disadvantage of soiling the linen.

For the conjunctiva I have used bichloride of mercury in solutions varying from 1-10,000 to 1-5,000, and Labarraque's solution, 1-50 to 1-20. Labarraque's solution, which Roux also recommends in diphtheria as the best local treatment to use in conjunction with injections of serum, has the advantage over sublimate of not coagulating pus and of having a solvent action on mucous secretions. This property of Labarraque's solution is due to its strong alkalinity. It is furth more in solution of 1-20 two and a half times more antiseptic th sublimate solution 1 5,000, and is also much better tolerated by t conjunctiva.

It would seem, in the light of the Proceedings of the Ophth mological Society (see *Annales d'Oculistique,* December), that if t advantage of irrigation of the conjunctiva in purulent ophthalm is so much questioned, it is because it has been used without su ficient consideration of the real antiseptic value of the caustic liquid a subject which I have carefully studied in my private laboratory.

These irrigations—and I quite agree with Dr. Despagnet (see t Proceedings)—cannot be generally employed if one is confined to t use of apparatus such as those of Kalt, Lagrange, etc.

A simple method is necessary, less costly, and within the means all. I think these conditions are realized in a method which I ha employed for a long time, and which I published in my little pan phlet, conjointly with the treatment of ophthalmia.

I employ a rubber bulb, holding from 150 to 200 cubic cent metres, furnished with a stiff canula of red rubber.

Irrigations are made every half-hour in severe cases. The bulb filled with antiseptic liquid at a temperature of 37° or 38° (C.), an the canula, covered with vaseline, is introduced under the lower l and then under the upper lid. The treatment is not painful. I ha seen children undergo irrigations without even waking from slee and have delegated its use to mothers in poor families, without a precautions, in the treatment of most serious forms of purulent co junctivitis complicated by corneal ulcerations, with the most su cessful results.

I have superintended the treatment twice a day, and I have bee surprised to find, as soon as the lids of the child could be opene with what rapidity the corneal ulcers have healed, leaving scarcely trace after a few months.

As my publication passed unnoticed, I think that the attention your readers should be called to it, and if there is a question of pr ority in the re-establishment of an old method, abandoned from wa of rational application, this priority certainly belongs to the simp and methodical treatment to the results of which I have referred.

Very respectfully,
DR. E. DOYEN (Rheims).

ANNALES D'OCULISTIQUE

Volume CXIII.—Number 2.

FEBRUARY, 1895.

I.—ORIGINAL CONTRIBUTIONS

MEMOIRS

THE USE OF CONVEX GLASSES FOR DISTANT VISION IN MYOPIA

By Drs. **L. DE WECKER** and **J. MASSELON.**

We propose to discuss the advantage to be gained in certain cases of myopia from the use of convex glasses for distant vision. Although this seems at first paradoxical, it is unquestionably true that myopes succeed in considerably increasing their sharpness of vision and are enabled to read characters at a distance which they could not distinguish with concave glasses, such, for example, as the name of a street or the number of a house, by placing at some distance in front of the better eye a convex glass, as they would use a lorgnette. The inconvenience of this procedure is in the fact that an inverted image is obtained; but with a little practice inverted characters are easily read, and the facts prove conclusively that this inconvenience is amply compensated for by the increased size of the image, since we know of myopic persons who make habitual use of such glasses.

The method of employing convex glasses in myopia consists in placing the glass before the eye at such a distance that its focus coincides with the *punctum remotum*. If the myope completely relaxes his accommodation, as he must do under other circumstances, he finds that with the aid of this convex glass the eye is adjusted for parallel rays and can see at a distance. An inverted image is thus obtained, just as the ophthalmoscopic observer receives an inverted image of a myopic eye when, withdrawing from the eye under examination, he adjusts for the *punctum remotum* of the observed eye, either by the aid of his own accommodation or by the use of a convex lens.

The amount of enlargement of the images of objects observed depends on the amount of myopia and the focus of the convex glass employed. With a given convex lens, the image is enlarged in proportion as the degree of myopia is higher. On the other hand, in equal degrees of myopia the amplification of the image increases with the use of weaker convex lenses. The use of weak convex lenses, in high degrees of myopia, to obtain considerable enlargement, is thus rendered impracticable by the fact that it is necessary to hold the glass at quite a distance from the eye, and the image is so enlarged that the field of vision becomes contracted and a slight movement of the hand which holds the glass results in the disappearance of the object observed.

Practically, glasses weaker than 5 dioptries cannot be employed, and it is desirable that they should be 5 or 6 centimetres in diameter. Under these conditions, the myope, with a little practice, can easily see the objects which he desires to observe, and the visual acuity will be found to be more than double that which is obtained by correcting the myopia with a convex glass, as we have recently had occasion to observe in a case of a person with myopia of 20 dioptries who had accustomed himself to the use of a convex lens.

It will be noticed that with convex lenses a phenomenon occurs exactly opposite to that which is observed in a myopic eye supplied with a concave lens, as in the latter case objects appear diminished in size (a fact which persons having both a myopic eye and an emmetropic or a hypermetropic eye can easily prove); on the other hand, if the myopia is corrected with a convex lens there is an enlargement of the image, and if the convex lens employed is suitable, the advantages are far superior to those obtained with spectacles.

In conclusion, we think it would be advantageous to extend the use of convex glasses to many cases where, with a high degree of myopia, the visual acuity is defective. Glasses of about +6 dioptries should be prescribed and used like the magnifying glass which certain people use for reading; they thus constitute a magnifying glass for distant vision. Since these glasses produce an inverted image, they are to be used only occasionally, when the myope wishes to see with precision small objects, such, for example, as a public notice, the name of a street, or the number of a house. In these special instances convex lenses will be regarded by certain myopic persons as quite superior to concave lenses, and they will be thankfully accepted as a valuable expedient.

Having had the opportunity of discussing this optical question with Dr. G. Poullain, our colleague desires to add the following note to our communication:

"I have made similar experiments," says Dr. Poullain, "and have been able to increase the visual acuity in several cases of myopia of a high degree; I have also made some attempts at obtaining an erect image.

"I at first attached a convex lens to one of the faces of the right angle of a rectangular prism, and by looking through the other face of the prism, held at a fixed distance from the eye, I was able, on making myself myopic, to see objects erect, but with this inconvenience, that the right side of the object was seen at the left, and *vice versa*, for the total reflection on the surface of the hypothenuse only caused the image inverted by the lens to be erect in the plane perpendicular to the faces of the prism.

"I then made the experiment of fastening two prisms together by one of the right-angle faces in such a way that the edge of one prism was perpendicular to the edge of the other. In this way the image of the object underwent the double erection required. Instead of attaching a convex lens to the incident surface only, I attached one also to the surface of emergence, the refraction of the two lenses being equal to that of the single lens of the first experiment; in this way either face could be used as the incident surface. But with this apparatus, only objects situated at the right or left could be seen, and considerable experience was necessary in order to make use of it. I preferred an arrangement similar to that of Porro's telescope.

"Half of the hypothenuse face of a right-angled prism was attached to half of the same face of another right-angled prism. On each of the free portions of the hypothenuse faces was attached a lens of 2½ dioptries, and by placing this biprism at a proper distance—that is, such that its focus was at the far point of the myopic eye—objects appeared *erect* and *enlarged*.

"Other things being equal, the field increases as the square of the face of emergence, and the weight of the biprism varies as the cube of the same side. This consideration raises an obstacle to the use of such a biprism: if it is too small the field will be too limited, and if it is large it will be too heavy.

"I have lately found the experiment on which this communication is based in the Optics of Kepler, Proposition LXXVII. This scientist, who had a myopia of high degree, without doubt found in his own case this peculiarity of a myopic eye, and I am inclined to think that it was the origin of the invention of his astronomical telescope. He understood that, to place a normal eye in the condition of his own, it sufficed to add to that eye the refractive power which he had in excess.

"In conclusion, I desire to call attention to the phenomena which occur in a hypermetropic eye under similar conditions—that is, in looking through a lens a number of dioptries less than the measure of his own ametropia and placed at a proper distance from the eye. Under such circumstances, the hypermetrope sees objects *enlarged* and *erect*, thus simulating Galileo's telescope, as in Kepler's experiment the excess of refraction of the myopic eye replaced the convex ocular of the astronomical telescope."

FORMOL IN THE TREATMENT OF PURULENT OPHTHALMIA

By Dr. **FROMAGET,**

Chief of the Clinic of the Faculty of Medicine at Bordeaux.

The recent discussion which has taken place at the Society of Ophthalmology of Paris concerning the communication of Dr. Kalt encourages me to publish here the results which I have obtained in treating a number of cases of purulent ophthalmia with formol.

The most serious objection which can be made to Dr. Kalt's work is that none but children with an ophthalmia of several days' duration have come under his care, since, according to his statement, "60% have not received proper attention until after the eighth day—that is, at a time when, in a grave ophthalmia, the cornea is often implicated," and "especially at a period when the ophthalmia is bound to decrease under any treatment whatever" (Valude).

The cases which I report here have been treated by me from the onset by a single method. I publish them such as they are.

Formol, the antiseptic qualities of which have been accurately established, and which was first recommended in ophthalmology by Valude, has been employed by me in two ways: as a collyrium in the proportion of 1 to 200, and as a wash, 1 to 2,000.

After carefully bathing the palpebral and bulbar conjunctiva with a solution of 1 to 2,000, I instil several drops of the collyrium.

The irrigations and instillations are performed four times a day.

I have used no irrigator, and am convinced that every oculist can cleanse the cul-de-sacs quite as well with his fingers and an ordinary elevator as with any irrigator whatever.

I had already used formol successfully in cases of catarrhal conjunctivitis, and have now submitted the new-born children from the obstetrical clinic of the Hôpital Saint-André who have required my attention to this treatment.

First of all, I will report the cases:

Case I.—Marcel L——, eight days old, was attacked five days after birth with a purulent ophthalmia in the left eye. (Maternity Department of the Hôpital Saint-André.)

The disease had already existed three days when the child was brought to the ophthalmological clinic. Treatment with formol (irrigations and instillations) was commenced on August 7, 1893.

On the 11th, there was considerable improvement. The cornea was not ulcerated, and was scarcely affected. Absolute recovery without corneal lesion on August 16—that is, after nine days.

Case II.—Catherine L——, five days old, was brought for consultation on September 14, 1893.

Purulent ophthalmia of twenty-four hours' duration.

Irrigations and instillations of formol.

Complete recovery after a few days.

Case III.—J. F——, born October 19, 1893, was brought twel days after to the ophthalmological clinic for a purulent ophth mia of six days' duration. The corneæ were not ulcerated. Abunda suppuration. Marked chemosis. Treated with formol, and recover was complete in eight days (October 31 to November 8, 1893).

Case IV.—André L——, born October 18, at the Saint-Andr Maternity; was brought for consultation with a purulent ophthalmi of two days' standing. No corneal lesions; recovery in eight days.

Case V.—Joseph X——, five days old, was attacked December 9, 1893, with a purulent ophthalmia in the left eye. On the 12th, he was brought to Professor Badal's clinic. The inflammatory phenomena were very intense, but the cornea was intact.

Treatment with formol brought about much improvement after the first three days. On the twelfth day, every trace of purulence had disappeared. There remained only a slight catarrh.

Recovery in twelve days.

Case VI.—Charles B——, four days old, attacked the day before with purulent ophthalmia in the right eye. Lids œdematous and red; conjunctiva swollen; chemosis.

No corneal lesions.

Recovery in ten days (January 13 to 24, 1894).

Case VII.—Marie J——, four days old, was brought from the Maternity to Professor Badal's clinic with a double purulent ophthalmia of twenty-four hours' duration.

Marked improvement at the end of three days.

Recovery without corneal lesion in seven days.

Case VIII.—Jean L——, five days old, brought from the Saint-André Maternity on March 19, 1894, for a purulent ophthalmia of twenty-four hours' duration. Slight inflammatory phenomena. No corneal disturbance.

Recovery under formol in eight days.

Case IX.—Fernand Fl——, born July 31, 1894, at the Saint-André Maternity, was brought to Professor Badal's clinic on August 7 for a purulent ophthalmia of the right eye.

The disease had commenced only twenty-four hours before, and no serious lesion existed; the symptoms of inflammation in the lids were as yet slight; no corneal disturbance.

Treatment with formol commenced on August 7.

On the 9th, improvement was quite marked; the pus was thinner and more yellow; the lids were not so swollen nor so red.

Rapid improvement set in, and on the 16th of August recovery wa complete without the slightest corneal trouble.

Recovery in nine days.

Case X.—N——, No. 431,975 of the register of the ophthalmological clinic, five days old, was presented September 27, 1893, for a double purulent ophthalmia, which had commenced twenty-four hours previously.

Abundant greenish thick pus. Chemosis; no corneal lesions.

Treatment with formol was energetically applied, and all the inflammatory phenomena receded after the third day, and the little patient left the hospital October 9, 1893, after twelve days' treatment.

The ten patients whose cases I have summarized were treated with formol from the onset. No accident occurred, and in no case was the cornea attacked.

The following cases, in which the treatment with formol was applied at a later stage, also resulted favorably, although nitrate of silver and sublimate irrigations had not retarded the progress of the disease:

Case XI.—L——, Jean, fifteen days old, was attacked with purulent ophthalmia three days after birth. (Saint-André Maternity.)

During the first twelve days of the progress of the disease the child had been treated at the Maternity with instillations of nitrate of silver. On the 2d of August, 1893, he was brought for consultation to the ophthalmological clinic. The lids were œdematous, the chemosis was enormous, and the purulent secretion very abundant. Irrigation with formol was immediately commenced, and instillations of the collyrium 1 to 200.

On August 5 the child was much better; the palpebral œdema had disappeared, and the chemosis was much reduced. The pus retained the same character (thick, yellow), but it was less abundant.

On the 7th, the pus, which had become very clear, was hardly noticeable.

On the 10th, recovery was complete, only a slight catarrh remaining.

The treatment lasted ten days.

Case XII.—D——, Henri, ten days old, treated for five days at the Saint-André Maternity for a purulent ophthalmia with instillatio of nitrate of silver and irrigations of sublimate.

September 12, 1893, irrigations and instillations of formol we commenced.

Decided improvement after eleven days of treatment.

Case XIII.—Ludovic X——, born February 24, 1894, at the Sain André Maternity, was attacked with double purulent ophthalmia o February 27.

When he was brought to the ophthalmological clinic, five days late (March 4), it was found that besides the intense inflammatory symp toms in the lid, there existed marked corneal disturbances on bot sides. Further, the right cornea presented a large ulceration (2 to 3 millimetres).

Treatment with formol was immediately commenced, and from tha day the corneal lesions ceased to increase, and gradually tended t recovery.

In nine days (March 13) the purulent secretion had disappeared, and seven days later (March 20) the ulceration had cicatrized with a slight leucoma.

Recovery in nine days.

The first conclusion which I would draw is that:

Treatment with formol has afforded notable results.

All the children treated by me at the Maternity recovered, and where corneal lesions already existed they did not increase.

Can it be said that the use of nitrate of silver would not have produced as good results? By no means; indeed, I am persuaded that it would have acted in the same way. But to acknowledge that the results produced by formol can be compared to those of the nitrate is to affirm at the same time the value of formol.

I also treated a young girl seventeen years of age attacked with purulent ophthalmia with formol. The disease was hardly twenty-four hours old, and the results were very satisfactory.

It was not successful, however, in two cases of blennorrhœic ophthalmia in adults. These two patients lost their sight from complete ulceration of the cornea with perforations. These are the two failures which I have to record.

These last results are certainly not brilliant. But it is to be admitted that in spite of the most energetic treatment with nitrate of silver eyes are not infrequently lost, and that speedily. The most serious purulent ophthalmias are those of blennorrhœic origin observed in adults, while the majority of ophthalmias of the new-born are far more benign.

I am convinced that formol is an excellent antiseptic.

It is preferable to sublimate, which rusts the instruments, and is, as the majority of oculists find, harmful to the cornea. Phenic acid cannot be used. Boric acid possesses hardly any antiseptic power, and its use is disappointing.

Nitrate of silver in solution is very rapidly altered by light and by contact with instruments.

The action of permanganate is, in my opinion, far from satisfactory.

Formol is not altered by light, it does not rust instruments, it is antiseptic, and presents but a single disadvantage, that of being painful in strong solution—for example, 1 to 200. But in proportion of 1 to 2,000 it is well borne, and produces no pain.

If, now, we were to make deductions, they would be as follows:

Nitrate of silver remains the leading antiseptic in purule ophthalmia; it should be used in the solution 1 to 30, or the crayon, and the cauterization should reach the conjuncti folds.

These applications should be made by *experienced han* through fear of causing corneal ulcerations which might op the door to infection.

But, in addition to cauterization, it is useful and *necessary employ conjunctival irrigations*, and there is need for an adju to nitrate of silver, which I think we have found in formol.

Besides cauterization with the nitrate, instillations and irri tions, performed with or without an irrigator, will be found advantage.

Formol is sufficient to cure ophthalmia of the new-born; trate of silver also gives excellent results. By combining th two we are sure of obtaining a satisfactory success.

In all cases where patients cannot be treated by practi hands, it is far better to have recourse to formol alone, wh can lead to no accident, than to allow applications to the c junctiva of solutions of nitrate of silver, because of the dan of destruction of the corneal epithelium.

Treatment of purulent ophthalmia with formol has also b tried in the service of Dr. Lagrange at the Hôpital des Enfa and the results published in the thesis of my old pupil, Dr. vier (Bordeaux, 1894), confirm the results which I have tained at the clinic of my preceptor, Professor Badal.

As at the present time an auxiliary, if not a successor, nitrate of silver is being sought, I have thought it well to p lish these results, which are brilliant enough to encourage pe verance in this treatment. I think that something may added to without detracting from the excellence of the method.

For every microbial affection, two aims must be realized: destruction of the infectious agent and the defertilization of media where it lives, to prevent those which have escaped action of the microbicide from living and from multiplying.

Nitrate of silver is the best microbicide; formol, as work of Valude and Dubief shows (*Annales d' Oculistique*, July, 1893), is a most excellent defertilizer; it is therefore the proper agent to complete the therapeutic work.

The combination of these two agents can produce only the best results.

FALSE LENTICONUS

By Dr. **L. DEMICHERI**, Chief of Clinic of Dr. de Wecker.

False lenticonus is that difference between the refraction of the nucleus and that of the cortex of the lens which exists at the commencement of cortical cataract, and which, without careful attention, might be mistaken for lenticonus.

In this article I shall only consider the variety of cataract called cortical, or nucleolar, the most frequent variety, and that in which the opacity commences in the cortical layers nearest the nucleus (Foerster). The more advanced the age of the patient, the more frequently are the layers nearest the nucleus the first to show the signs of change.

The first indication of the commencement of cataract is frequently given by the appearance of an irregular astigmatism, arising from the peculiar change which is going on in the constitution of the lens.

At the very onset, when no opacity of the lens, or at least a very slight one, exists, a diminution in sight may be noticed, which bears no relation to the degree of loss of transparency of the refractive media, but which is easily explained by the refractive changes in the eye in which it exists.

It is this condition of the lens, quite well known, which I wish to study in a more careful manner than has been previously done, with the aim of showing how guarded one should be in making a diagnosis of lenticonus.

I wish also to attempt to solve a question which has not greatly attracted the attention of classical writers—myopia dependent on cataractous changes (1).

I have observed two kinds of myopia in the case of a commencing cataract. A myopia exclusively central, which may reach a high grade, but which is accompanied by a peripheral hypermetropia (false lenticonus). The second variety of myopia is, from the clinical point of view, different from the first, as we cannot demonstrate an appreciable difference in refraction between the central and peripheral portions of the lens, and also because it is usually of a lesser degree than in the first variety.

We shall see directly that these two kinds of myopia are induced by the same cause, and that if there is a clinical difference, it is easily explained. It depends on a knowledge of what layer of the cortical mass is affected.

This article is founded on a series of cases which I have observed at the clinic in the Rue du Cherche-Midi. I shall describe one case in detail, because I think it is the first time that catoptric images of the nucleus of the human lens have beer demonstrated. Besides, it is the classical and invariable descrip tion of false lenticonus.

M. B——, fifty-six years of age, merchant, came for consu tation on December 5, 1894, on account of a diminution sight in both eyes, which had been increasing, according to th patient's statement, for three years in the left eye, and for a st longer time in the right.

Objective examination showed no change in the exterior po tions of the eye. The cornea was of regular curvature, and th keratoscopic image showed no change in any part of its exten The anterior chamber was of normal depth.

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(1) Myopia produced by cataract (so favorable for near vision, since it count balances presbyopia) was observed by early writers (Walthers, Scarpa), but it w Critchett the elder who called attention to this subject, which had fallen into obli ion (Heidelberg Congress, 1875). As to the grade to which it may extend, it is n generally indicated by these authors, or it is far below the actual facts (2 dioptrie The most accurate figures are those which were given by Drs. de Wecker and M selon some time ago—that is, 6, 8, and 10 dioptries. Even these figures may be su passed.

On direct illumination, with a concave mirror, small crystalline opacities were noticed, especially in the right eye. But the most notable feature of this examination was the ease with which the nucleus of the lens could be outlined, it appearing like a small lens enclosed in the larger mass, and which was displaced in a contrary direction to the movements of the eye without completely disappearing from the field of a moderately dilated pupil.

In the right eye, opacities were already clearly marked in the perinuclear layers; in the left, opacities of the layers nearest the nucleus were made manifest on the crystalline mass by a shadow, which was displaced with the movements of the mirror.

The first impression produced by this examination (especially by skiascopic examination) is that of the central shadow of a keratoconus, or of a lenticonus, if the regularity of the corneal surface has first been established. Indeed, the crystalline opacities are so slight that one is not at first inclined to attribute the diminution in sight to such slight obstructions.

The idea of a conical malformation of the refractive media finds still more weight on examination of the fundus of the eye. When the papilla, which is healthy, is examined with the inverted image through the central portion of the lens, it appears small, and more or less rounded; but on examination through an eccentric portion, the image of the papilla is to some extent deformed, being drawn out and increased in size. The centre of the lens, then, is more refractive than the cortical layers.

Examination with the erect image also shows this deformity of the image of the fundus of the eye, and, in a still more precise way, the particular change in the refraction of the lens. In fact, by the aid of this method, it is shown that the central portion of the eye is myopic in both eyes, while the peripheral portion is hypermetropic.

By the skiascope a central shadow is shown which turns about an axis, as has been described for keratoconus, and also a peripheral shadow which moves in an opposite direction to the movements of a concave mirror. This shadow is only sharp when the pupil is dilated.

Functional examination of the eyes gave the following result:

O.D. M.10., $V = \frac{1}{6}$.
O.G. M.3., $V = \frac{2}{3}$ diff.

A second examination was made on December 24, with
result:

O.D. M.10., $V = \frac{1}{6}$ (1).
O.G. M.6., $V = \frac{2}{3}$ diff.

Vision of the left eye without glasses was barely one-t
I also measured with the erect image the peripheral hype
tropia in relation to the papilla, and found it 6 dioptries fo
right eye and 4 dioptries for the left eye. The difference, t
between the central and peripheral portions of the eye w
dioptries (!) in the right eye and 10 dioptries in the left.

In the presence of these differences of refraction the idea
lenticonus is easily accepted, hence the necessity of maki
careful study of the Purkinge images (2). In my patien
images on the anterior and posterior surfaces of the lens are
fectly normal, and are not changed in form or intensity wit
most varied movements of the eyes.

This is not, then, a deformity of the surface of the lens,
peculiar change in the index of refraction of the lens v
greatly resembles the descriptions of lenticonus. I propo
call this condition of cortical cataract by the name of
lenticonus.

Briefly, the central and peripheral portions of the lens
different indices of refraction, and the change of the ind
abrupt if the surface of the nucleus and the nearest co
layers are compared. This change in the index is suggeste

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(1) This myopia, which was shown by the trial glasses, was also found
patient with Young's optometer. Unfortunately, this apparatus, recently
mended by Tscherning, and which is of great utility from an optical standpoi
first very difficult to manipulate, and the patient was unable to measure the ref
of the peripheral portions of the pupil.

(2) There is generally wanting, in the published accounts of lenticonus, a
study of the Purkinge images. The study of these images is the essential ele
the diagnosis of conical formation of the lens. It is well, therefore, to call at
to this condition of the lens, which may simulate lenticonus. Perhaps on mo
ful examination a large number of supposed cases of lenticonus would disappe
I must, however, make an exception for the case of lenticonus reported by Gul
(*Nordisk Ophthalmologisk Tidsskrift*, VI.). In this case the Purkinge imag
studied with much care.

direct examination of the eye, by the demarcation of the nucleus, and by the shadows which are movable.

I was convinced of a pathological demarcation of the nucleus of the lens which was in complete contradiction of the physiological absence of demarcation; but, desiring an optical proof of this phenomenon, I determined to investigate the catoptric images of the nucleus (1).

I took my patient to the ophthalmological laboratory at the Sorbonne, where, with the assistance of Dr. Tscherning, I studied the multiplication of the catoptric images of the lens.

The left eye of the patient was examined in a dark room, by the aid of electric light passing through a circular opening and condensed by a lens, the pupil being dilated with homatropine.

Under these conditions, in certain positions of the eye, five reflex images were seen (2). I have drawn the relative positions of these different images, and my friend, Dr. Seijs, has undertaken to make my drawings more clear.

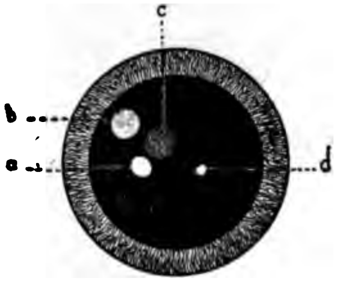

Fig. 1.

a Image of the cornea.
b — of the anterior surface of the lens.
c — of the anterior surface of the nucleus.
d — of the posterior surface of the lens and of the posterior surface of the nucleus.

In the first figure the eye was directed in such a way in relation to the light that five images were found in the pupillary field.

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(1) Catoptric images of the nucleus have been studied in the eyes of cattle after death by Dr. Tscherning.

(2) In this article I do not take into consideration the image on the posterior surface of the cornea.

The most brilliant image (*a*) is that of the cornea. Behind this is the image from the anterior surface of the lens (*b*), and from the anterior surface of the nucleus (*c*). This latter is more diffuse, less luminous, and situated more in advance than that from the anterior surface of the lens.

At the right of the diagram is seen a small brilliant reflex (*d*), which is the image from the posterior surface of the lens, but which has a small diffused tail. If the eye is turned in such a way that the corneal image falls on the internal portion of the limbus, this small tail is seen to separate from the image from the posterior surface of the lens to form a fifth image situated further back (see Fig. 2). This fifth catoptric image is quite diffused, and has its origin in the posterior surface of the nucleus (1).

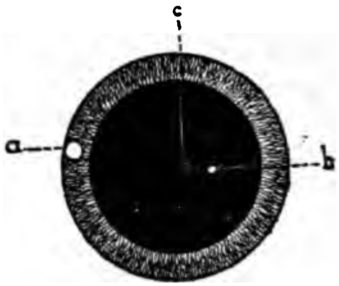

Fig. 2.

a Image of the cornea.
b — of the posterior surface of the lens.
c — of the posterior surface of the nucleus.

Two conclusions may be deduced from the study of these four catoptric images of the lens:

1. The images on the nucleus are the nearest to the axis of the eye, and are at different levels. The image from the anterior surface of the nucleus appears further forward than that from the anterior surface of the lens. In the same way, the

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(1) I have also been able to observe this multiplication of the Purkinge images, with the same positions and appearances, in two other aged patients, also affected with false lenticonus.

image from the posterior surface of the nucleus appears further back than that from the posterior surface of the lens.

This arrangement of the images shows that the radii of curvature of the nucleus are smaller than the radii of curvature of the lens.

2. The catoptric images of the nucleus are diffuse. If, then, it is true that there is a separation or a sensible difference between the nucleus and the cortical layers, it is also true that this separation is not altogether abrupt. There is a certain point of transition in the index of refraction.

These curious changes of refraction which the eye undergoes are, I think, easily explained from an optical standpoint. But before giving my views, so different from those published up to the present time, I wish to review briefly the development of cortical cataract, as it is treated by the most prominent authors.

The actual cause of senile cataract is a sclerosis of the nucleus of the lens, which is only one of the general manifestations of the tendency which tissues of epidermoid origin have to become hardened (1).

Retraction of the nucleus is, then, a constant senile manifestation. If this retraction takes place in a slow and progressive manner, so that the cortical layers have time to become identified, little by little, with the structure of the nucleus, we have, as a result, a hard, black cataract—the cataract without a nucleus, as Wenzel calls it.

If, on the other hand, the retraction of the nucleus takes place irregularly or rapidly, then the cortical layers are separated from the nucleus by an interstice which is filled with a serous fluid. This, then, is the origin of the semi-soft senile cataract, cortical or nucleolar.

The chemical changes which occur during the development of a cataract are also very interesting in the explanation of false lenticonus. While the black cataract is characterized by a progressive sclerosis of the lens, without loss of solid substance, there is always in a cortical cataract a more or less perceptible loss of albuminoid substances, which escape into the aqueous humor (Ed. Jaeger).

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(1) **Wecker and Landolt**: Complete Treatise, Vol. II.

In the first period of this last variety of cataract, which alone interests us in this article, there exists, along with this loss of albumen, an increase of water in the cortical layers, which produces a slight swelling of the lens.

I have thus briefly stated the development of senile cortical cataract in order to deduce two conclusions:

1. The nucleus of cortical cataract undergoes no other changes than those of senile sclerosis. It is almost identical with the nucleus of a very aged person. All ophthalmologists who have studied a complete cortical cataract have been struck with this fact.

2. The refraction of the cortical layers of the lens is, I think, diminished in the first period of nucleolar cataract. This diminution in refraction is a necessary consequence of the loss of solid substances in the lens, which are replaced by water.

I wish now to relate several facts in physiological optics which were known to Thomas Young (1).

The lens is composed of a series of superimposed layers whose indices of refraction increase progressively from the periphery to the centre, and which have the form of diverging menisci. The nucleus of the lens is almost spherical, and, therefore, while its index of refraction is greater than that of the cortical layers, its radii of curvature are smaller than those of the anterior and posterior surfaces of the lens.

The lens, for simplicity, may be considered as composed of three lenses : The first, the nucleus, represents a strong convergent lens, while the other two, the anterior and posterior cortical layers, act as two diverging lenses.

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(1) Ophthalmological Works, annotated by Dr. Tscherning, p. 133.

There are then two different and contrary forces acting in the lens: The converging force of the nucleus, and the diverging force of the periphery. If the index of refraction of the cortical layers is increased, the diverging force is increased—that is, the focus of the entire lens is lengthened. The refractive power of the lens would thus be less if the index of refraction of the cortical layers was equal to that of the nucleus (1).

I am now in a position to explain the changes in a commencing cataract and the appearance of false lenticonus.

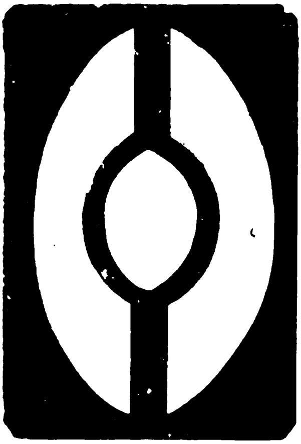

Fig. 3.

The lens resolved into three lenses (after Landolt).

Central myopia of a more or less high degree may depend either on an increase in the refractive power of the nucleus or a decrease in the refraction of the cortical layers, or on these two factors combined.

If the cortical layers are not changed, a very slight increase in the index of refraction of the nucleus will cause a myopia of 10 dioptries, or even more, in the central portion of an emmetropic eye.

If, on the other hand, the refraction of the nucleus is not changed, the same changes of refraction may be explained by a slight diminution in the refraction of the cortical layers, thus reducing the divergent force which exists in the periphery of the lens, and which in an indirect manner increases the refraction in an opposite way from the nucleus (2).

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(1) **Landolt**, in Wecker and Landolt, Vol. III.

(2) Under the direction of Dr. Tscherning, I have been able to calculate how slight a change in the index of the cortical layers would produce a perceptible change in the refraction. If these figures are not perfectly exact, they are sufficiently so for a comparative calculation.

Suppose the radii of the surfaces of the lens (RR') are 10 and 6 mm.; those of the nucleus (rr') 4 and 2 50 mm. Suppose that the index of refraction of the nucleus is 1 06 (1.41 in relation to air), that of the cortical layers 1.045 (1.39).

Which of these two theories is the true one?

In favor of the latter are the following reasons:

1. Anatomical study, which was briefly summarized above, shows that the lens undergoes actual changes only in its cortical layers. In these layers, there is a subtraction of an appreciable quantity of albumen (Deutschmann), and at the same time an addition of water. While the index of refraction of the periphery of the lens diminishes at the onset of cortical cataract, the nucleus is undergoing senile sclerosis almost insensible,

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The refraction of the nucleus will then be :

$$\frac{1}{f} = n - 1 \left(\frac{1}{r} + \frac{1}{r'}\right) = 0.06 \left(\frac{1}{4} + \frac{1}{2.50}\right) = 39 \text{ dioptries.}$$

That of the cortical layers will be :

$$\frac{1}{f'} + \frac{1}{f''} = n' - 1 \left(\frac{1}{R} - \frac{1}{r} - \frac{1}{r'} + \frac{1}{R'}\right)$$

$$\frac{1}{f'} + \frac{1}{f''} = 0.045 \left(\frac{1}{10} - \frac{1}{4} - \frac{2}{2.50} + \frac{1}{6}\right) = -17 \text{ dioptries.}$$

The refraction of the entire lens will then be 39 — 17 = 22 dioptries, from which the total index may be calculated:

$$\frac{1}{f} = n - 1 \left(\frac{1}{R} + \frac{1}{R'}\right) = 22 \text{ dioptries.}$$

$$\frac{1}{f} = 22 \text{ dioptries} = n - 1 \left(\frac{1}{10} + \frac{1}{6}\right)$$

$$n = 1.44 \text{ (in relation to air).}$$

Suppose now, that the index of the nucleus remains the same, while the index of the cortical layers diminishes to 1.02 (1.36 in relation to air).

The refractive power of the cortical masses will then be :

$$\frac{1}{f'} + \frac{1}{f''} = n' - 1 \left(\frac{1}{R} - \frac{1}{r} - \frac{1}{r'} + \frac{1}{R}\right)$$

$$\frac{1}{f'} + \frac{1}{f''} = 0.02 \left(\frac{1}{10} - \frac{1}{4} - \frac{1}{2.50} + \frac{1}{6}\right) = -7.50 \text{ dioptries,}$$

therefore the cortical layers lose 9.50 dioptries, which is gained by the nucleus in myopia.

The refraction of the peripheral portion was

$$0.045 \left(\frac{1}{R} + \frac{1}{R'}\right) \quad 12 \text{ dioptries.}$$

It is now

$$0.02 \left(\frac{1}{R} + \frac{1}{R'}\right) = 5.50 \text{ dioptries.}$$

Toward the periphery there will be a hypermetropia of 6.50 dioptries.

at least in its structure, to the more rapid changes of the portions surrounding it.

2. If the change of the index of refraction of the nucleus can account for the central myopia, it can never explain the existence of a high degree of peripheral hypermetropia, which is found in these cases.

Intelligent patients, such as the one whose case is above reported, can give quite accurate statements as to the former condition of their refraction. My patient, a man very careful of his eyes, claims that he always had perfect vision both for near and far points. He had passed forty-five years without needing glasses to read, or to write in his account book. Without material error, it may be said that he was formerly emmetropic, or nearly so. In any case, it could not be said that his eyes were formerly hypermetropic to the extent of 6 and 4 dioptries. With this degree of emmetropia, one does not reach the age of forty-five years with good vision for far and near points, and it would be impossible to write without glasses.

If the changes in the nucleus were sufficient to explain the existence of a high degree of central myopia, the diminution in peripheral refraction could never be explained by this single factor. On the other hand, the same alteration in the cortical layers explains all the phenomena: the paracentral hypermetropia by direct action, and the central myopia by diminution of refraction opposite to that of the nucleus.

3. Another phenomenon which I have observed in many patients is the rapid progress of the myopia. I have said, in the case reported above, that in the space of nineteen days the myopia, which in the left eye was 3 dioptries with acuity ⅔ (diff.), increased to 6 dioptries with the same acuity. In another patient, seventy-four years of age, I found in the left eye, on November 15, 1894, a myopia of 3.50 dioptries, from false lenticonus. On December 23, the myopia was 11 dioptries, with reduction of the visual acuity.

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At the clinic in the Rue du Cherche-Midi, when I wish to compare the visual acuity of an eye with opacities of the lens at two different periods, I am in the habit of diminishing the convex glass in the second examination, if the patient was formerly hypermetropic, or of increasing the concave glass, if myopia had already been shown. In this way I obtain, in the majority of cases, a better visual acuity than with the old correction.

I wish also to call attention to a fact that I have frequently noticed, and which existed in the case reported: The myopia may increase to an appreciable extent without a notable change in the visual acuity after correction. With myopia of 3 and 6, the visual acuity always remained $\frac{2}{3}$ in my patient.

This rapid change in the myopia does not greatly favor the idea of a change in the nucleus of the lens. The sclerosis of the nucleus is a process of very slow progress; it remains almost unnoticeable for many years, and although starting in youth, it does not become apparent until an advanced age is reached. To admit of rapid alterations in the intimate structure of the nucleus of the lens, especially at a very advanced age, is to contradict the physiological laws which govern its development.

Let us see, on the other hand, what is taking place at the same time in the cortical layers. The microscope, the ophthalmoscope, and experimental studies, all show an appreciable and evident change in these layers. During this time, the nucleus remains uninfluenced by the more or less rapid changes of the surrounding portions, and it may retain its physiological aspects in the centre of a ripe cataract.

If a change in the nucleus is claimed, it can only be a decrease in its radii of curvature, a thing which is improbable, and which by itself is insufficient to explain the clinical picture of false lenticonus.

I stated at the beginning of this article that another kind of myopia might be seen in the course of a cortical cataract without showing in a precise way a diminution in the refraction of the peripheral layers. If these patients are carefully examined, it will be seen that the opacities are quite near the anterior surface of the lens. In this case, the nucleus is not outlined, and the layers nearest to it are transparent.

It must be admitted here that the diminution in the refraction of the cortical layers occurs in the more eccentric layers, and it is these alone which are altered. The divergent force of the periphery is then diminished to a certain degree, and the increase of the refractive power of the nucleus is dependent upon this degree of diminution. Naturally, in these cases, the myopia is much less, and I have never seen it surpass 3 or 4 dioptries. The hypermetropia, which is entirely peripheral, is almost impossible to observe.

Whenever I find a myopia of 6,.8, or 10 dioptries in the course of a cortical cataract I am sure of finding a peripheral hypermetropia if the pupil is dilated.

In recent articles on this subject, this myopia is generally attributed to an increase in volume of the lens. I think this explanation altogether improbable. The refractive power of a lens never depends on its volume, but on the length of the radii of curvature of its two surfaces. If the lens is swollen in a uniform manner without changes of the index, it will have the same value as a lens that it formerly had. In order that this swelling of the lens may increase the convergence of the visual rays which traverse it, an increase in the curvature of its surfaces is necessary—that is, a diminution in its radii of curvature. The diameter of the lens should not increase.

But clinical observation shows that in these varieties of senile cortical cataract it is the portions nearest the border of the lens which give origin to the striæ which later on invade the entire lens. The border of the lens would then swell and increase in size, thus preventing a total increase in the refraction.

Physiological study also shows that the lens derives its principal elements of nutrition in the neighborhood of its equator. It is also in the perilenticular space that the great nutritive current of the eye passes. Slackening or changes of this current which would cause alterations in the character of the lens would consequently react with greater energy on its equator.

I think that I have shown in my article that cortical cataract at its onset may present many surprises by resembling in the most evident manner a lenticonus. The most careful examination of the capsular reflexes is indispensable, in these cases, to make a diagnosis. Unfortunately, not enough importance is assigned to-day to catoptric images in the eye.

MODERN CATARACT EXTRACTION

By Mr. **Charles BELL TAYLOR** (Nottingham).

When Dr. Waldau, von Græfe's assistant, proposed to excise a small portion of the iris and to extract cataract with a spoon, he did so because, while suppuration of the eyeball was not rare after cataract extraction, it never occurred after a simple iridectomy. The idea occurred to me that a slight enlargement of Waldau's incision would enable us to dispense with the spoon, and it was doubtless by a similar reasoning that von Græfe was led to adopt his celebrated method of linear extraction. Von Græfe dispensed with the spoon, and made his incision much further back than Waldau, so that, as he says, it should coincide with a meridian of the eyeball, and as it was quite impossible to make such a section either with the large keratome used in Waldau's operation (Fig. 1), or with the cataract knife in vogue at that time (Fig. 2), it became necessary to invent the long narrow blade known by the name of Græfe's knife (Fig. 3), and which, since its invention, has played such an important part in the technique of ophthalmic surgery.

The advantages of von Græfe's operation are as follows : The sclera, which alone is incised, is far less inclined to suppurate than the cornea ; the elasticity of the tissues in this region, and the linear character of the incision, render separation of its edges almost impossible ; while the conjunctival flap, which after-

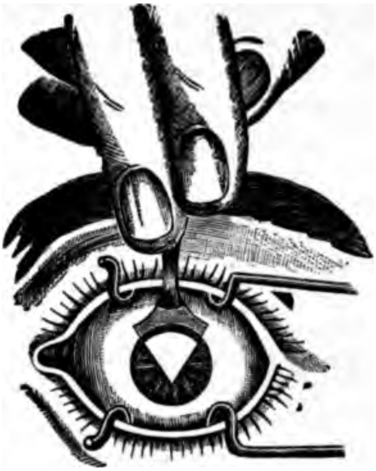

Fig. 1.

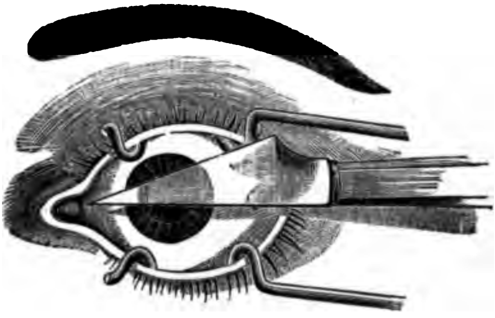

Fig. 2.

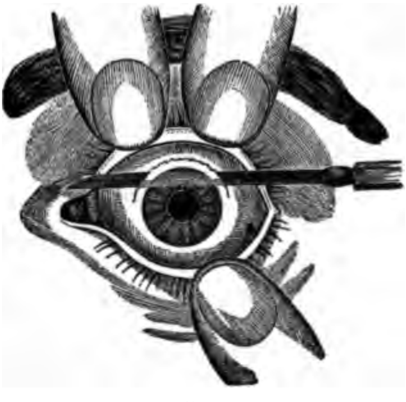

Fig. 3.

tion of the capsular reflexes is indispensable, in these cases, to make a diagnosis. Unfortunately, not enough importance is assigned to-day to catoptric images in the eye.

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By Mr. **Charles BELL TAYLOR** (Nottingham).

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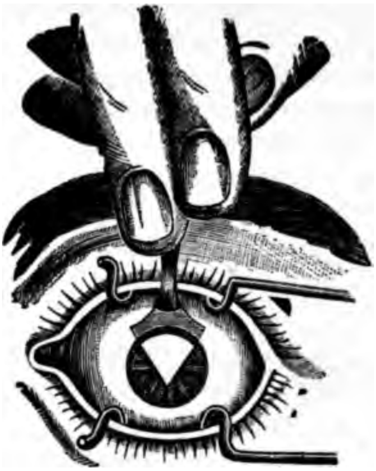

Fig. 1.

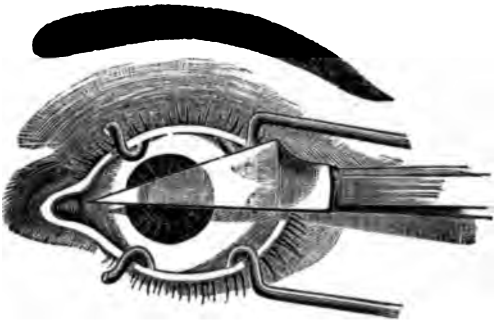

Fig. 2.

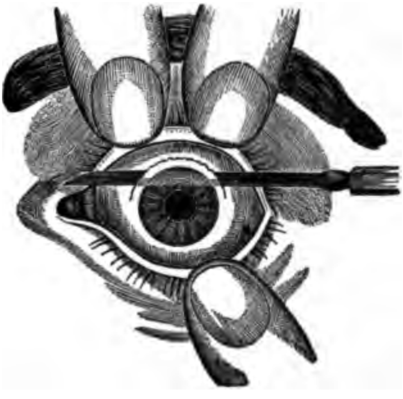

Fig. 3.

wards becomes adherent to the sclera, is a powerful safeguard against microbial infection (1).

On the other hand, an extensive iridectomy is necessary with this form of incision; the proximity of the edges of the wound, while assuring rapid cicatrization, render the extraction of the lens somewhat difficult. Hemorrhage frequently complicates extraction, the vitreous is likely to escape, and iritis, irido-cyclitis, and sympathetic ophthalmia are more frequent in this than in any other method of cataract extraction.

Evidently the disadvantages exceed the advantages; those who have adopted, or were supposed to adopt, von Græfe's operation, have considerably modified it, so that it might be said that nothing remains of the operation but the knife. The modifications all tend in the same direction: advancement of the incision, either to the sclero-corneal junction or to the corneal tissue proper. This operation, the modified von Græfe, as it is called, which I adopted more than twenty years ago as an improvement on the spoon extraction of Waldau, is to-day the favorite operation of the majority of ophthalmologists (2).

Unfortunately, if I may venture to say it, it necessitates the mutilation of the iris, and since it is possible, and even easy, to extract the lens without cutting the iris at all, it is not surprising that certain modern surgeons, without being restrained by the authority of von Græfe's name, have ventured to enlarge still more Waldau's incision, and have finally dispensed, not only with the spoon, but also with the iridectomy.

It is important to consider on what grounds the modified von Græfe operation, or the combined method—that is, iridectomy combined with extraction—should be considered as the operation *par excellence.* It may be affirmed and maintained that this method of operation does not lead to contusion of the iris, and prevents prolapse; that it enlarges the pupillary area and increases the chances of future vision; that it greatly facilitates the escape of the lens and forms an opening for the harmless escape of the aqueous humor, and reduces to a minimum the necessity for secondary operations, which are questionable.

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(1) Manolescu, Knapp, and others. Transactions of the Heidelberg Congress, 1886, p. 164.

(2) See my essay, "A New Method of Cataract Extraction," published in the *Edinburgh Medical and Surgical Journal* for February, July, and April, 1868.

On the other hand, it is plain: that the extent of wounded surface is doubled by excision of the iris; that the entire method is contrary to the sacred principles of conservatism which should animate every surgeon; that cocaine, though a powerful anæsthetic in simple extraction, is insufficient to prevent pain, spasm, and resistance provoked by excision of the iris; that iridectomy prolongs the operation, fills the anterior chamber with blood, and exposes the capsule of the lens, the vitreous, and the uveal space to all the dangers of entanglement, protrusion, and infection; that it is an error to suppose that the lens and capsule cannot be easily extracted without hurting the iris, and that the visual and cosmetic results are far superior when the pupil is left intact and free in the anterior chamber.

These are certainly strong and powerful objections to iridectomy; however, it is impossible to deny that the majority of ophthalmologists still practise it. Why is this? Simply because, although iridectomy does not at times prevent entanglement and prolapse of the iris in the angles of the wound, it undoubtedly prevents prolapse of a large fold of this membrane between the lips of the incision. If we could prevent this escape of the iris, the dreaded prolapse, the *bête noir* of extraction, we would never think of excising the iris; but the method of preventing it without cutting the Gordian knot, and without altering the form of the pupil, is the problem which today awaits solution.

Let us see what has been accomplished in this direction. Prolapse may be prevented by excision of the periphery only of the iris (Fig. 4); by reduction of the tension, if it is in excess, or seems liable to be so; by taking great care that the edges of the wound are properly placed for coaptation; by careful evacuation of the anterior chamber, so that no protrusion may result from swelling of the cortical masses; by scrupulous attention to the dressing, to prevent reflex spasms. One should also be assured of the intelligent co-operation of the patient to avoid accident during or after the operation.

When the eyeball has been incised, the wound closes, and the anterior and posterior chamber are ordinarily restored after three or four hours; the union between the lips of the wound is very slight, and if during the first days the patient coughs violently, is restless, sneezes, or contracts the lids, the aqueous humor will surely be driven out, and the iris protrude between the lips of the incision. Common sense will dictate what precautions should be adopted, what regimen to follow, what advice to give to avoid accident, and although I must admit that the surgeon is anxious during the first days after a simple extraction, I do not think, all things being considered, that in adopting this operation there is much to fear; prolapse is the only danger, and certainly in the great majority of cases it does not occur. A slight prolapse is not of great importance, and an extensive one, when it occurs, may ordinarily be corrected by future treatment and ultimate formation of an artificial pupil.

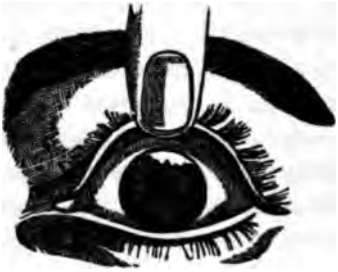

Fig. 4.

Fuchs insists upon iridectomy as a necessary part of extraction "when there is a tendency to conjunctivitis, or when the eyeball is prominent, or when there is a tendency to prolapse of the iris, when the pupil is rigid, or the cataract is not ripe, and when the patient is in bad health, or has only one eye." One should be guided by his own judgment, under such circumstances, but I have frequently performed simple extraction in cases where these contra-indications existed with the best possible results.

In regard to the technique of the operation, everything depends upon the first incision; its form, its size, and its position are therefore of the greatest importance. I prefer to make a small flap above, 3 to 5 millimetres, because in this situation the wound is better protected than when it is made below, and less likely to be infected than when it is exposed in the gap formed by the two lids.

Galezowski diminishes the height of the flap by making his puncture and contra-puncture in the sclera, and completes his incision at the summit of the cornea, as he says, to avoid prolapse of the iris, while Perrin, Warlomont, Monoyer, Teale, and others encroach more or less upon the cornea.

I think, however, that the best position for the wound is in the sclero-corneal junction, because in this situation the iris is less inclined to prolapse, the wound cicatrizes more rapidly, is less likely to suppurate, leaves a less apparent scar, and produces no astigmatism (1).

Wherever the incision is placed, one should be sure that the section is large enough; an incision a little larger than necessary is of no consequence, but if it is too small it may lead to serious results.

The knife that I use is much finer and narrower than that of von Græfe; it is curved at such an angle that the right hand may be used, if necessary, for the left eye (Fig. 5).

I always hold the eyeball with fixation forceps, and having inserted the knife at the sclero-corneal junction, just above the horizontal meridian at the base of the proposed flap, I pass it

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(I) At the time when I operated upon all forms of cataract without iridectomy I thought at first that prolapse of the iris could be avoided by making a corneal section like that of Liebreich. This was an error which I promptly corrected, and since that time I have made the wound entirely in the vicinity of the corneal border. Prolapse and entanglement of the iris are thus rendered less frequent.

rapidly through the anterior chamber until the point escapes at a contra-puncture symmetrically placed. Then I cut rapidly upward, in order to pass in front of the iris, which would otherwise attach itself to the blade of the knife, and slowly complete the section quite near the vascular limbus of the cornea. Several surgeons, Schweigger, Gayet, Tweedy, Swanzy, Valude, Trousseau, and others prefer to incise the capsule during the passage of the knife through the anterior chamber, but I prefer to use a cystitome delicately introduced beneath the upper border of the pupil, and confine the incision to the periphery of the capsule or the equator of the lens. Projection of the lens indicates the result of the incision, and then a slight pressure will induce the lens to turn on its axis and present in the pupil, which it slowly dilates, before it escapes, followed by cortical masses.

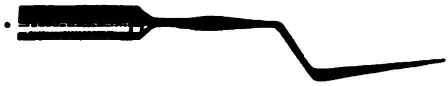

Fig. 5.

If the cataract does not move, it is because the capsulotomy is insufficient, the lens larger than was supposed, the iris too rigid, the corneal incision too small, or because the lens itself is so contracted that it does not respond to as strong a pressure as can be made without danger; in this case the capsule should be reincised, the corneal wound enlarged with scissors, an iridectory made, or the cataract extracted with a spoon.

When the periphery alone has been incised, as Knapp advises, the cortical débris, if there is any, is relatively of no consequence, but in any case it may be easily cleared out by irrigating the conjunctival sac with a warm sterilized solution of common salt (½%). Small fragments may be visibly brought into the field of the pupil and easily expelled without introducing any instrument between the lips of the incision. The iris, which then frequently prolapses, may be easily returned to place by a slight massage on the closed lid, while contraction of the pupil is assured by instilling a drop of a solution of eserine. It is of the greatest importance to keep the wound from contact with the external air, so that ordinarily I do not remove the tampon placed on the closed lid during the first two or three days; the eye is not opened until the sixth day; it is also well to put cocaine and eserine in the eye not operated upon, and to limit the movements of the eye which has been operated upon by keeping the other closed.

In the way of antiseptics, I use a 4% solution of boracic acid; the supporting instruments are sterilized by exposure to the heat of a lamp, which I always use in my operations, while the cutting instruments are rendered aseptic by immersion in absolute alcohol.

To understand that the objections to this simple operation are neither valid nor serious, the following comparative statistics of the two operations, furnished by Dr. Greefe, of Professor Schweigger's clinic, and which may be considered as average figures, should be consulted:

Without Iridectomy		**With Iridectomy**	
(450 operations)		*(371 operations)*	
Successes............	346 or 76.5 per cent.	Successes............	278 or 75.1 per cent.
Secondary cataract.	84 or 19.1 "	Secondary cataract.	71 or 19.2 "
Eyes lost............	20 or 4.4 "	Eyes lost............	22 or 5.7 "

It is stated that the only advantage of iridectomy is that it prevents an extensive prolapse of the iris, which is proved. It is also said that the only advantage of simple extraction is that it preserves the natural appearance of the eye, which is without doubt true, but far from being the entire truth. The picture which is given of old and tottering men and women who have lost all interest in life, who care nothing for personal appearance, who, provided they see, do not insist upon seeing well, and whose eyes are so well hidden by the thick glasses which they are obliged to wear that it is impossible to say whet they have had an iridectomy or not, is really only applicable a very small number of persons operated upon for cataract.

RECURRENCE OF A HYDATID CYST OF THE ORB TWO YEARS AFTER A FORMER OPERATION

By Dr. **TERSON** (Toulouse).

Hydatid cysts of the orbits are so rare among us that may be interesting to give the complete history of each ca With this in view, I now recall the account of a case publish in *Annales d'Oculistique* (March, 1893) under the title of "C of the Orbit, Probably of Hydatid Nature, with Exophthalm Cured by a Simple Puncture."

A boy thirteen years of age presented, as a sequel to an ac enteritis, a large tumor in the supero-internal region of the l orbit, with marked deviation of the eye outward and downward. terference with the retinal and retrobulbar circulation was shown a considerable papillary stasis with diminution of the visual acu below $\frac{1}{20}$. The pressure on the eye from behind forward had mo fied the refraction, producing a hypermetropia of 1.75 D. T tumor was of quite regular form, but there was neither fluctuati pulsation nor murmur, facts which led me to make an explorat puncture, with aspiration. In this way 15 to 20 grammes of an ab lutely transparent and colorless liquid was evacuated. At the sa time, the eye resumed its natural position in the orbit. On the n day visual acuity had increased from $\frac{1}{20}$ to $\frac{1}{2}$. On the sixth day temporary hypermetropia had almost disappeared, and the acuity l returned to the normal.

After three months, this satisfactory result was not altered, an presented the patient at the Medical Society of Toulouse (Janu 21, 1893) as an example of a probably permanent cure.

One of my colleagues doubted the diagnosis of hydatid cyst, and even of a cyst, and stated that he regarded the case as a serous tenonitis.

At the end of a year a sort of nucleus of induration was observed at the point formerly occupied by the cyst, without exophthalmus or diminution of visual acuity, and which was attributed to the retraction of the thickened walls of the sac of the cyst.

During the present summer, two years after the former treatment, the exophthalmus reappeared quite suddenly, leaving no doubt of a recurrence of the former trouble, and after several weeks of delay the patient again came under my care. As before, the pressure from the tumor had produced a very marked papillary stasis, with reduction of vision to vague perception of light. The volume of the tumor was considerably less than before ; absence of fluctuation would indeed have suggested a solid tumor, if the result of the former treatment had not been an element of certainty in the diagnosis.

There was undoubtedly a recurrence of the cyst formerly punctured ; but was the diagnosis of hydatid cyst (originally given from the resemblance of the encapsulated liquid to rock-water) exact, in the absence of microscopic examination for scales of scolex, or other hydatid débris ? With the aim of determining the diagnosis and of reaching a more radical cure, I undertook, considering the relatively moderate size of the tumor, to effect its complete extirpation. The rounded mass of the cyst was carefully separated from the surrounding tissue, but the very deep implantation of the tumor was an insurmountable obstacle to the entire realization of my project, hemorrhage at length preventing further manœuvres. Through fear of causing too great injury, I cut through the wall of the cyst with scissors, in order to diminish the size of the tumor and to render the deep parts more accessible. Immediately there appeared several intact hydatid vesicles of various sizes, thus confirming my first diagnosis. This discovery induced me to perform a careful scraping of the sac with a sharp curette, in order to destroy all its contents, and especially such parasites as might be hidden in the deeper parts. In this way there was removed a large quantity of membranous débris of numerous daughter vesicles, which broke under the instrument and led to the escape of more colorless fluid. Prolonged irrigation with a solution of sublimate of 1 to 2,000 brought out still more débris. By then drawing the sac forward with strong forceps, I excised it as deeply as possible. Four sutures closed the wound, and a compressive dressing was applied.

Several hours later, the dressing was saturated with a somewhat abundant hemorrhage. During the first few days, there was fever, swelling of the lids, and a certain amount of protrusion of the eye, which caused me to fear an orbital phlegmon. But on the fifth day, after decided ecchymosis of the conjunctiva, the exophthalmus and chemosis rapidly diminished, and everything resumed its proper condition.

On the fifteenth day, visual acuity had increased to ½; on the 25th day, after the correction of a very slight hypermetropia, the acuity was almost equal to 1. Recovery was then assured and imminent. Is it to be permanent?

This sequel to my interesting case shows that the diagnosis of hydatid cyst may in certain cases be made with precision entirely from the physical qualities of the cystic fluid; it also shows the error of my colleague, who, contrary to my own opinion, believed in the existence of a serous tenonitis, not taking into consideration the fact that this latter affection produces a *direct* protrusion of the eye, as I clearly showed in my case that the exophthalmus and the deviation of the eye *was outward and downward.*

The recurrence further shows the insufficiency of simple puncture of hydatid cyst, notwithstanding the considerable time during which cure may seem to be assured. It must, then, be candidly admitted that it is proper to add to the puncture injection of a parasiticidal solution, as has been recommended in general surgery for hydatid cysts of the liver, or to employ some other method of treatment.

Was the attempt at total extirpation of a sac justifiable in this case? Yes, if one considers: 1, the moderate size of the tumor; 2, the absence of fluctuation, which indicated very thick walls and removed the fear of penetrating the sac by a puncture; 3, the danger, perhaps imminent, of extension to the cranial cavity, instances of which have been reported, the intraocular lesions clearly showing that the optic nerve was already implicated at least in its envelope. However, the difficulties encountered in the course of the operation show that one should not in this case, as in many other things, look for an absolute method ; it was for this reason that during the operation my plan was changed and different methods were combined, either of which alone would not have produced a more permanent result than simple puncture: incision of the sac, curetting, and of prolonged antiseptic irrigation.

The extirpation of the mother vesicle of an echinococcus cyst has been performed by simple traction with forceps after incision of the connectival tissue envelope surrounding it. I think that this result might be realized in cases with very small cyst (Valude). Long irrigation may facilitate success. But careful curetting of the sac seems to give a sufficient guarantee by rendering the destruction of the parasites with a solution of sublimate more easy.

I would not advise the use of a drain after incision of the cyst, because, while it may lead to the expulsion of the mother vesicle, it frequently provokes suppuration in the sac, which may spread to all the fatty tissues of the orbit and lead to loss of vision. The use of rigorous antisepsis does not entirely prevent accident in such a region as the conjunctival sac, where, even in the normal state, various microbes are found, which become dangerous as soon as an opening is made to infection.

In conclusion, I would recommend the following treatment of hydatid cysts of the orbit :

1. Puncture with aspiration, followed by parasiticidal injection (sublimate 1 to 1,000).
2. In case of immediate non-success, incision of the sac and an attempt completely to remove the mother vesicle by traction with forceps, followed by prolonged irrigation with a solution of sublimate 1 to 2,000, better borne by the conjunctiva than the 1,000 solution.
3. In case of recurrence : If the cyst is not large, complete extirpation may be attempted, which will be possible without much injury when the tumor does not extend too deeply. But in different conditions, the important phase of which will be a marked papillary stasis, a partial extirpation should be attempted as deep as possible after having destroyed by curetting and anti-

septic irrigation the primary vesicle and the hydatid secondary cysts which it contains.

I would reserve, then, extirpation of the cyst for cases of recurrence, because this is a laborious operation, on account of the very limited space in which the instruments must be manipulated, and as the various tissues contributing to the motility of the eye may be injured.

It is well to know in advance what one may do and what is to be avoided, as few details in this connection have been written. It is also very difficult to possess an extensive personal experience of these cases, as in a thirty years' practice this is the only case of hydatid cyst of the orbit which I have observed.

Let me, in closing, emphasize several points worthy of remembrance. My young patient had no periorbital neuralgic pains, such as are seen in echinococcus cysts of the orbit ; also there did not appear, before treatment, any of the signs of infection of the neighboring tissues often seen in cases of cysticercus of the same region.

The youth of this patient (thirteen years) and his sex are to be noticed in comparing with hydatid cysts of the liver. According to statistics, men are attacked 80% more frequently than women.

I would refer to the former portion of my article for information regarding the literature of hydatid cyst of the orbit.

II.—REPORTS OF SOCIETIES

OPHTHALMOLOGICAL SOCIETY OF PARIS

Session of February 5, 1895.

Traumatic Cataract.

Dr. Meyer presented a patient with a traumatic cataract caused by the penetration of a foreign body into the lens. The opacity of the lens assumed a star-shaped form, but later, after having been quite pronounced, it gradually decreased to such a point that vision at present equals $\frac{1}{8}$. The foreign body is easily seen in the lower portion of the lens in a region which does not correspond to the point of entrance, and which it has reached by virtue of the law of gravitation. There has been no reaction, and Dr. Meyer thinks that under the circumstances expectant treatment was advisable.

Dr. Chevallereau thought that immediate operation was preferable, and that it was better, in consideration of the results of operation, not to wait until forced to operate by inflammatory symptoms.

Drs. Valude and *Darier,* on the other hand, favored expectant treatment, by reason of the absence of reaction and the preservation of the visual acuity.

Gummatous Syphiliderm of the Conjunctiva.

Dr. Meyer then presented, in the name of M. de Rothschild, a student, a model of the eye of a syphilitic patient, which presented papules situated at the point of the sclero-corneal limbus of the right eye, associated with an intense cutaneous irruption. The papule formed a projection of 1½ millimetres, was the size of a bean, and overlaid the cornea and the conjunctiva; in the conjunctival portion was a well-marked zone of vascularization. These lesions disappeared only under very prolonged treatment.

The Advantage of Convex Glasses for Distant Vision in Myopia.

Dr. Masselon.—(*See the article in full in this number, p. 83.*)

A Case of Traumatic Amblyopia.

DR. TROUSSEAU.—A young girl fourteen years old received a blow on the left eye in December, 1893. Her piano teacher, by a rapid movement, struck her in the eye with the corner of a sheet of music. On the next day, the eye was somewhat red, and there was lachrymation. The patient felt the presence of a foreign body, and claimed that a piece of paper had surely entered the eye. A careful search by the attendant physician revealed nothing. The acute condition lasted fifteen days, then subsided, and the eye regained its normal aspect. From that time, the young girl complained of a progressive diminution of vision, until in March, 1894, she declared she could see nothing with the left eye. Two distinguished ophthalmologists saw the patient and gave a diagnosis of hystero-traumatic amblyopia. In July, 1894, I saw the patient, and found complete amaurosis of the left eye, with dilatation of the pupil and anæsthesia of the upper lid. Mydriasis did not prevent the pupil reacting to light.

Every precaution was taken to detect simulation.

Thanks to careful watching, I was sure that the young patient did not use any mydriatic. When, at a later examination, I turned back the upper lid and exposed the superior cul-de-sac, I was surprised to find a small lacerated bit of paper, which was covered over with mucus. I asked myself if the patient had not herself placed this paper between the lids, but although this was possible, I decided that the evidence was against it, as the condition of the foreign body was such as to suggest a long sojourn in the cul-de-sac. On the next morning, a small bit of paper was found in the internal angle of the eye, and from that time the symptoms improved, so that fifteen days after, vision was perfect. The mydriasis and palpebral anæsthesia had disappeared.

Was this a curious form of reflex traumatic amblyopia, an hystero-traumatic amblyopia, or a pretended amaurosis? The clinical facts seemed interesting enough to be reported.

A New Method of Cleaning out Cortical Fragments after Cataract Operation.

DR. CHIBRET.—This method consists in the simultaneous use of injection and aspiration. An ingenious device made by Aubry accomplishes this result with a syringe modelled after that of Anel. Chibret has combined aspiration and injection in a systematic manner in thirty cataract operations. He is well satisfied with the result, as it does away with secondary operations and leaves the pupils clear.

He has found only one inconvenience, a disturbance of the anterior chamber lasting about eight days in cases where a large quantity of liquid (20 grammes or more) has been used. This disturbance disappears and leaves very clear pupils in cases where otherwise a secondary operation would have been advisable or necessary.

Chibret thinks that, with the exception of sclerosed cataracts of people over sixty-five or seventy years of age, one is never sure, even with a clear pupil, of not leaving cortical fragments at the equator, which may compromise the visual acuity. He has been able, with his instrument, to extract from the posterior chamber a large amount of cortical fragments in cases where the condition of the pupil, friction of the lids, and injections indicated a perfect cleansing.

Delirium after Cataract Operation.

DR. J. SANTOS FERNANDEZ (Havana) describes seven cases of delirium following cataract operation. In his opinion delirium is not caused by a single and identical factor. Occlusion of the lids, nostalgia, age, moral impression, diet, alcoholism, the use of alcohol by patients not accustomed to it, and the absorption of atropine, may all be exciting causes of the delirium. Warlomont observed it in old people from simple occlusion of the lids. Sichel has never seen it in people under sixty years of age. Parinaud thinks that the cerebral disorders should be attributed to the prolonged occlusion and lack of nourishment. Grandclément and Galezowski think that the influence of atropine cannot be doubted.

Chibret mentions alcoholism as a cause. Gillet and Grandmont refer to diet. After operation, Schmidt-Rimpler thinks that it is caused by the abrupt suppression of the irritation which light exercises on the optic nerves. Martin attributes it to diet.

Pseudo-Membranous Conjunctivitis.

DR. ELIASBERG (Salonique) described two cases of pseudo-membranous conjunctivitis and three cases of ophthalmia in the new-born, complicated with the formation of false membrane. No bacteriological examination was made. Treatment consisted of daily applications of ointment of yellow oxide of mercury in the strength of 1 to 40, followed by a moist antiseptic dressing of boric acid, renewed every twenty-four hours. All these cases terminated favorably, with one exception, in which about the fourth week symmetrical ulcerations were formed in both corneæ, which left no other trace than slight simple leucomas.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM

Session of January 31, 1895.

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Two Cases of Diphtheritic Conjunctivitis Treated by Klein's Antitoxine.

MR. JESSOP described two cases of pseudo-membranous conjunctivitis in young children of undoubted diphtheritic character, as was shown by the presence, at the site of the lesion, of the bacillus of Loeffler, the virulence of which was proved by inoculations in a guinea pig. One of the little patients was eighteen months old, and had a diphtheritic throat; in the other, nineteen months old, there was a nasal diphtheria. In both cases the ocular lesions were bilateral, and invaded only the palpebral conjunctiva. In the case of the first child, the speaker made three injections of Klein's antitoxine in the dose of 4 grammes to an injection, and in the second case two injections of the serum in the same dose. The false membranes disappeared in the first patient in three days, and in the second in four days. In the first case, there was an apparent relapse in the form of a false membrane situated on the left tonsil, but the presence of Loeffler's bacilli could not be shown. No local treatment was employed in Mr. Jessop's patients; he contented himself with cleansing the eye with distilled water.

Mr. Hayward.—I examined the false membranes in the two cases, and found Loeffler's bacilli in great abundance.

The membrane was very well marked in both cases, but was only on the palpebral mucous membrane. Its complete and rapid disappearance could only be attributed to antitoxine, as I have never seen a case recover so rapidly.

Mr. Mackinlay.—I have also obtained rapid recoveries by Tweedy's method, which consists in the internal and external use of quinine; nevertheless, the results were not as rapid as in the cases described by Mr. Jessop.

Extraction of the Lens in Myopia; a Case of Myopia of 25 D.

MR. WRAY.—I think that extraction of the lens in myopia is indicated under certain circumstances, but not in childhood if the myopia is less than 10 dioptries, nor in an adult when it does not exceed 12 dioptries. The object of the operation is: 1st, to prevent detachment of the retina; 2d, to arrest the progress of choroidal lesions; 3d, to allow persons with high degrees of myopia to work at a convenient distance.

These conclusions are based on 123 cases, with a total of 246 eyes examined, among which were found the accidents of detachment and diminution of vision from lesions of the choroid. He thinks that detachment in high degrees of myopia is less to be feared than changes in the membranes of the fundus of the eye, and therefore the operation does not seem objectionable to him, although he has seen detachment follow after extraction of the lens in myopia of 30 D.

Mr. Spencer Watson hesitates to remove the lens as a remedy for myopia. He does not see how this procedure will arrest the progress of the myopia. The vitreous humor, which is diffluent, is a source of danger.

Mr. Marshall had seen, in one case, detachment as the result of such an operation, and in another suppuration of the eyeball.

Mr. Rockliffe had seen an acute iritis consecutive to extraction.

Mr. Lang, in five operations, had had two detachments of the retina. He therefore rejects this operation.

Visual Acuity in Public Service.

MR. MACKAY thinks that an examination of the sight is of great importance in many of the public services. Examinations are frequently insufficient or performed by incompetent persons. It is especially so in the merchant marine and railway service.

Mr. Doyne clams that except in the navy, the examinations are farces. Candidates are frequently admitted with myopia double that fixed by the regulations.

Messrs. McHardy, Bickerton, Priestley Smith, Critchett, Ridley, and *Lanz* took part in the discussion.

THE MEDICAL AND SURGICAL SOCIETY OF BORDEAUX

Session of January 25.

Keratitis and Dentition.

Dr. Sous read an article on this subject. A child nine years of age was attacked in 1893 with diffuse keratitis in the right eye and hydrarthrosis of the knee on the same side. In 1894 a temporary episcleritis appeared in the left eye, followed by a diffuse keratitis. Applications of warm water to the eye produced pains in the left superior maxilla, in which the first molar was growing in a false direction. The temporary canine was removed, and the ocular disturbances disappeared in three days.

Dr. Sous discussed the influence which rheumatism, syphilis, and dental development could have exerted on the disease of this child, and was inclined to admit the influence of the latter cause.

Dr. Armaignac.—Corneal opacities are of varied character, and their study is far from being completed. In several cases where episcleritis advanced progressively all around the cornea a corneal infiltration may be seen to follow it and to disappear behind in proportion as it advances, without leaving any traces. This is not keratitis but a trophic disturbance caused by a deep inflammation in the peri corneal sclero-conjunctival region. We do not as yet know the exact character of this corneal disturbance, and it may disappear completely in several days, as it may also persist in places for weeks or months, or even indefinitely.

These temporary disturbances of the cornea in episcleritis seem to be analogous to that observed by our colleague in his patient, who had had episcleritis. As for the relation which may exist between the corneal infiltration and the dental displacement, it is certainly curious, and it seems unreasonable to regard it as a simple coincidence, considering the rapid disappearance of the opacity immediately after the extraction of the tooth.

The sympathetic reflex which exists between the eye and the teeth is well known, and if the anatomical reason is not clearly explained, the pathological fact has been demonstrated. The case of Dr. Sous, while it is unique, is nevertheless true, and I am of the opinion that the eye was probably predisposed by the former episcleritis, but that the dental displacement was the determining cause of the corneal disturbance.

Dr. Dunogier.—According to the dentist, the tooth showed no pathological lesions, no periostitis, and no caries. The root had commenced to be reabsorbed, but there was as yet no decay, and, consequently, no pain or inflammation at the root of the tooth.

In the light of new doctrines, I have become somewhat exacting from a pathogenic standpoint; it seems, then, difficult for me to allow that the reabsorption of the root, a purely physiological phenomenon, could have caused inflammatory disturbances in the eye, and which in any case were slow to show themselves, as several milk teeth had already been lost and replaced without accident.

I think, then, that especially considering the antecedent history of the patient, this should only be considered as a simple coincidence.

Dr. Rolland.—I see no relation of cause and effect between pain relieved by the extraction of the first deviating molar and a diffuse keratitis which disappeared at the same time, as in the case which Dr. Sous has described.

The case reported by our colleague and its termination is only the result of a curious and interesting coincidence.

I cannot admit that two organs with such distant anatomical relation can pathologically influence each other.

The cornea is enervated by the ciliary plexus, which comes from the ophthalmic ganglion, which comes from the ophthalmic nerve of Willis, arising in the Gasserian ganglion.

The small and large molars are enervated by the superior maxillary nerve, forming the posterior and superior dental nerves, which arise before the superior maxillary nerve passes through the infra-orbital canal.

To explain their action, then, it is necessary to invoke a centripetal impression which shall reach the Gasserian ganglion to return to the cornea, or from the cornea by the same root to the little molar.

As for the pains in the canine fossa, arising in the infra-orbital plexus, the same anatomical obscurity exists. At its exit from the infra-orbital foramen several nerve filaments go to supply the lid and conjunctiva, but none of them reach the cornea.

There could, then, be no possible relation.

There could likewise be no communication on the part of the lymphatics or the circulation.

Dr. Sous.—Was the corneal disturbance caused by episcleritis? In this disease, as Dr. Armaignac says, a corneal opacity known by the name of sclerosis is seen in the neighborhood of the sclerotic. This opacity has peculiar characteristics. It is limited by the border of the cornea, its borders are clearly defined, and the corneal epithelium was normal. In my patient the corneal disturbance did not accompany the episcleritis, but succeeded and replaced it. It was not situated at the border of the cornea. It invaded, from the start, the entire half of the cornea. The epithelium was affected, and the diffuse infiltration at the borders showed a progressive process. This was, then, not a corneal sclerosis, but an active keratitis.

Did dentition play any rôle whatever? Drs. Dunogier and Rolland think not. Dr. Dunogier founds his objection on the absence of dental caries, and Dr. Rolland only sees in the recovery a coincidence following in the course of a rheumatic affection.

Applications of warm water to the eye always produced pain at the situation of the tooth, and it was the appearance of this symptom that called attention to the condition of the superior maxilla. These pains could only be attributed to a reflex action of the fifth nerve, which enervates both the eye and the teeth.

CLINICAL SOCIETY OF LONDON

Session of January 5.

Detachment of the Retina in Granular Atrophy of the Kidney.

Mr. West described two cases of granular kidney accompanied by detachment of the retina, an accident of rare occurrence in atrophic nephritis, as these are the only cases of the kind which the speaker has seen among a large number of ophthalmoscopic examinations in cases of Bright's disease.

The first case of Dr. West was a woman twenty-two years old, who for nine months had suffered from headache, vomiting, and diminution of sight. Seven years before she had had a severe attack of acute nephritis. When the speaker saw her for the first time she showed the usual symptoms of granular kidney, in which was included albuminuric retinitis. Six days after her admission to the hospital a general purpura appeared, which disappeared in a short time. Five days later a detachment of the retina was found of non-hemorrhagic origin, which rapidly extended to the entire retina, with the exception of its superior segment. In three weeks a retrobulbar hemorrhage occurred which produced severe pain. The patient left the hospital in this condition and was lost sight of.

The speaker's second case was that of a young man suffering for two months with vomiting and headache, and who in six days became blind. A well-marked albuminuric retinitis was found, with all the other symptoms of granular kidney. Seventeen days later the retina became detached, and a short time after, the patient died.

Mr. Coupland considers the prognosis of albuminuric retinitis as very grave, since from his clinical experience patients hardly live one year after an ocular lesion.

Mr. Hale White said that he had seen a man with an albuminuric retinitis unaccompanied by any notable disturbance in vision. The patient left the hospital considerably improved, to return some time after with other symptoms of Bright's disease. At that time, no further abnormal disturbances were found in the eye. This was the only case in which Mr. White had seen ocular lesion of nephritic origin disappear completely.

The speaker also described the case of a man who came for consultation with a hæmatoma of the ear in whom albuminuria was found. Three months after, he was seized with uræmic symptoms.

Mr. White then called attention to the pathological fact of Bright's disease that interstitial nephritis in people about thirty years of age assumes a singularly rapid development, suggesting the idea that these cases form a special clinical group.

Mr. West also considers the prognosis of albuminuric retinitis as most grave, patients only surviving a few months after this ocular complication. The speaker has seen vesicle hemorrhages occur in the course of interstitial nephritis; he at one time saw an abundant intestinal hemorrhage without any lesion of the digestive tract, as was ultimately shown on autopsy, but he had never seen hæmoptysis.

MEDICAL SOCIETY OF BERLIN

Session of January 23, 1895.

Albuminuric Retinitis of Pregnancy.

Dr. Silex.—All the peculiarities of albuminuric retinitis in pregnant women are not yet well known. Dr. Silex is in possession of eparations which show the vessels intact.

Its symptomatology and prognosis are very inexactly treated in literature, and its therapeutics have been much neglected. The author has given much attention to this special pathological subject for many years, and has arrived at definite conclusions in regard to the affection.

To form a judgment of a case, it is necessary first to make a critical ophthalmoscopic examination of the retinal arteries. In the first stages of the disease, the central artery is often seen with the erect image transformed into a large white cord. This is produced by dilatation of the perivascular lymphatic space. This change may disappear, but hyaline degeneration of the arteries threatens the canals of the vessels, which may compromise the function of the internal layers of the retina and produce atrophy of this membrane and of the optic nerve. If the vessels are normal, albuminuric retinitis presents little danger. This form of retinitis may arise from an affection of the kidneys during pregnancy, an acute or chronic nephritis the general symptoms of which are early developed. The visual disturbances develop slowly, most frequently in the second period of pregnancy, especially in primiparæ. If they develop rapidly, chronic nephritis must be assumed. After delivery, vision is established more or less completely.

In 22 patients examined during a considerable period, 11 recovered vision more than $\frac{1}{6}$, 10 others remained with a lesser degree of acuity, and five of them were almost blind. This unfortunate result was due to atrophy of the optic nerve, to retino-choroiditis, and to detachment of the retina, which occurred at a later stage in both eyes. These figures are so important, from a social point of view, that Silex advises interference with pregnancy in all cases where retinitis is found. Its prognosis is indeed uncertain : the women are frequently attacked with eclampsia, and the hope of a living child is but faint. In chronic nephritis, danger to the life of the mother and child settles the question of interference ; in case of nephritis of pregnancy, premature delivery is not advocated, as in several cases good vision has returned after expectant treatment.

The condition of the retinal vessels should decide the question of interference. For example, in two pregnant women, at the commencement of the eighth month, one having an acuity of $\frac{6}{18}$, and the other of $\frac{1}{18}$, one might be authorized to perform premature delivery in the first case on account of the vascular changes, while one should wait in the second. It is interesting that Dr. Silex has been able to find large quantities of albumen in the urine during one or two years without development of chronic nephritis in several women in whom the retinal lesion had disappeared and the general health had remained good. The long duration of albuminuria has not always a bad prognosis when it can be attributed to a renal affection of pregnancy.

ACADEMY OF MEDICINE OF BELGIUM

Session of January 26.

Organization of a Blood Clot in the Eye.

Dr. Venneman.—I have undertaken several experiments with the purpose of improving ocular prosthesis. Retraction of the stump which follows enucleation produces a partial obliteration of the conjunctival membrane, of the muscles, and consequently of the foundation for prosthesis.

I have obtained, first in rabbits, and then in man, by enclosing a blood clot in the eyeball, the hardest and most resistant stumps, by means of the organization of this clot.

I have seen in rabbits (experiments with incomplete evacuation) and in man (melanosarcoma complicated with supra-retinal hemorrhage) the pigmentary epithelial cells proliferate, invade the blood clot, and mingle with the young indifferent cells arising from the proliferations of the fixed cells of the conjunctival tissues.

I am uncertain whether the cells of ectodermic origin are called upon to aid in building up the new conjunctival tissues which take the place of the clot, and that contrary to the theory of the three blastodermic layers.

If I cannot to-day furnish a solution of this question, I think that the method which I have pointed out for solving the problem is capable of producing good results.

MEDICAL SOCIETY OF THE HOSPITALS OF BUCHAREST

Session of January, 1895.

Operative Treatment of Myopia.

Dr. J. Siklœssy reported two successful cases of treatment of myopia by a removal of the lens.

1st Case.—A woman thirty-five years old, with myopia of 14 D., and advancing choroidal lesions. The author first performed an iridectomy, and fifteen days later linear extraction of the lenses. Clearing up was rapid in one eye, and slow in the other. Vision in the right eye was 6.50 with + 1 D. The left eye was not examined.

2d Case.—A child fourteen years old was operated upon by discission, according to the ordinary method.

The author thinks it is not easy to give absolute rules for this operation ; one should be guided by circumstances.

III.—REVIEWS OF OPHTHALMOLOGICAL JOURNALS

Archives of Ophthalmology

Reviewed by Dr. SULZER.

Vol. XXIII., No. 4.

I.—Traumatic Paralysis of the Abducens Nerve,

by Dr. PURTSCHER.

In an exhaustive monograph the author collects all the cases of paralysis of the abducens published up to the present time, with a number of personal observations, and discusses their probable localization. After mentioning the rare cases in which a traumatism separates the tendon of the external rectus from the eyeball, or injures the muscle itself, and the only known case of traumatism of the orbital portion of the abducens, as well as paralyses from pulsating exophthalmus of traumatic origin, the seat of which is probably in the cavernus sinus, he passes on to the consideration of proper intra-cranial traumatic paralyses.

The classical cases of unilateral traumatic intra-cranial paralyses of the abducens have been treated in several recent articles, analyses of which have appeared in these *Annales* (see Vol. CXII., p. 114, and Vol. CX., p. 223). We will not, then, stop to explain the mechanism of basal fractures. In the 46 cases of simple or double intra-cranial paralyses of the abducens collected by Dr. Purtscher, the paralysis was in 36 cases the direct result of traumatism ; in 19 of these 36 the disturbance persisted, in 9 there was recovery, and in 9 others the final result was unknown. In 8 cases the paralysis was secondary. An autopsy was made in 11 fatal cases, 6 of which were secondary, the cause of the paralysis being abscess of the brain in 3 cases, induration in 1, and neoplasm in 2. The primary bilateral cases were ordinarily caused by hemorrhage at the base of skull, while the secondary cases were usually nuclear, due either to a softening of the brain at the seat of the traumatism, to a cerebral abscess, or to neoplasms. It may happen that the first abducens is paralyzed by a hemorrhage at once, while the second one is affected later from softening.

The occurrence of primary or secondary cortical paralysis is possible.

The optic nerve was affected in almost one-quarter of the cases, most frequently from a fracture involving the optic foramen. Bilateral lesions of this nerve are to be referred to fracture of the sella turcica. In only one case of the 13 of bilateral paralysis of the abducens was a visual disturbance noticed, and even this one was not certain.

The oculo-motor nerve was only affected three times, and the trochlear but once, in the 47 cases.

The trigeminal nerve was paralyzed in 5 cases. It was always primary in unilateral paralysis of the abducens, and always occurred on the same side.

In 7 cases of unilateral paralysis of the abducens there was facial paralysis. In 6 of these the two paralyses occurred on the same side. In 1 they were opposite. The same nerve was paralyzed in 4 cases of bilateral paralysis of the abducens. Three of the 11 cases of facial paralysis were secondary. The primary cases were probably the result of longitudinal fracture of the base of the cranium.

The acoustic nerve was affected in 2 cases of bilateral paralysis of the abducens, a lesion which is to be referred to a fracture of the base.

An examination of these facts shows the comparative frequency of bilateral paralyses. In cases of paralysis of the abducens, bilateral paralysis is found in the proportion of 4.7%, while in traumatic cases it reaches the proportion of 28.3%. The complications of traumatic paralysis of the abducens depend on the direction of the traumatic force. A force acting in a diagonal direction on the base of the skull may cause a fracture running the length of the petrous portion of the temporal bone, and extending in a diagonal direction through the body of the sphenoid to the optic foramen opposite. The other optic foramen may be injured at the same time by a second fracture, beginning at this point and running parallel to the former fracture.

A transverse fracture of the petrous portion of the temporal bone would be caused by forces acting in the line of the sagittal suture. When the occiput is forced down upon the spinal column the fracture surrounds the foramen magnum. In conclusion, a very interesting fact was mentioned. In persistent traumatic paralyses of the abducens a rapid contraction of the antagonist is developed. This contraction is not found, according to Mauthner, in congenital paralyses of the abducens.

II.—Traumatic Paralysis of the Abducens Nerve,

by Dr. FRIEDENWALD.

The author adds to the preceding article the cases of paralyses of the abducens published since the article of Dr. Purtscher appeared in the German edition of the *Archives of Ophthalmology*. They are ten in number, and were reviewed in the *Annales* at the time of their publication. An eleventh unpublished case was one which came under the author's observation. The paralysis of the abducens was bilateral, without any other nerve disability, excepting partial paralysis of the sensory portion of the right trigeminus. The paralysis of the sixth pair was secondary, and gradually disappeared, while the facial anæsthesia persisted for a long time. The patient, forty years of age, had his head violently compressed between two railroad cars. A hemorrhage from the nose and ears was the only external symptom of traumatism which the patient presented on admission to the hospital in an unconscious condition. The left pupil was larger than the right. The fissure visible in both auditory meati left no doubt of the diagnosis. On the fifth day a paralysis of the left external rectus made its appearance, and at the end of the third week the right external rectus was likewise affected. This paralysis disappeared in the left eye six weeks after the accident, and a little later in the right eye.

In 116,000 patients examined at Hirschberg's clinic, 1,500 cases of muscular paralyses were found, of which 438 were cases of paralyses of the abducens. Of this number, 32 were congenital paralyses, and 406 were acquired. Of the latter, 21 were traumatic, all of these being unilateral. Of 97 cases of fracture of the skull (48 of the base, 49 of the root) treated at the surgical clinic of Professor Bardeleben, at Berlin, there were only two cases of paralysis of the abducens, while the facial nerve was affected in 22 cases.

III.—A Case of Scleritis; Microscopic Examination,

by Dr. KOSTENITSCH.

A case is reported in which the sight of one eye was lost at the age of twelve years, optico-ciliary neurotomy was performed at the age of twenty-four, and seven months after the neurotomy the eye was enucleated. There were, previous to the enucleation, two typical scleral nodules, one below and to the nasal side, and the other on the temporal side.

On microscopical examination, the vessels of the conjunctiva were found to be increased in number and in size and filled with blood. The lymph channels in the superficial layers of the conjunctiva were dilated, and often contained granular masses, which took the hematoxylin stain, but were not colored by the methods of Loeffler and Gram. The same condition existed in the vessels of the sclerotic. In the sections through the lower outer quadrant of this membrane leucocytes occupied all the layers of the sclera and formed at various points small nodules and tracts. At some points where the cellular infiltration was particularly well marked were found slight hemorrhages in which the red corpuscles had undergone changes, while the leucocytes were polynuclear. The fixed cells of the sclera were increased in number, but the fibres showed no changes. The corneal epithelium was cloudy and contained leucocytes. Descemet's membrane, which had lost its endothelial layer, was partially detached from the cornea.

The author considers these changes in the cornea as secondary and consecutive to the scleritis.

IV.—On the Corneal Suture in Cataract Extraction,

by Dr. Kalt. (See *Annales d'Oculistique*, Vol. CXII., p. 271.)

V.—Further Anatomical and Clinical Contributions to the Study of Central Scotomata in Affections of the Optic Nerve, by Dr. Sachs.

In a former article it was demonstrated that the most vulnerable point of the retina for toxic influences and other diseases is the maculo-papillary bundle situated near the centre of the retina on the temporal side. It lies in a horizontal direction from 1° to 8° from the fixation point. Its vertical breadth is the greater, and is situated mostly below the horizontal line. Within these narrow limits the scotoma acquires its greatest development and leaves its last traces. This portion of the retina, which the author calls "the nuclear spot," is situated between the point of fixation and the blind spot.

Dr. Sachs has had the good fortune to make an autopsy on a patient who had had a very pronounced toxic amblyopia, the symptoms of which had been very carefully noted for fifteen months. Visual disturbances, characteristic and pronounced when the patient was first seen, improved greatly before death. Microscopical examination, however, showed marked histological changes. The papilla, at first congested, presented later a pallor in the temporal portion. Death was caused by a pulmonary phthisis.

The most pronounced changes in the fibres of the optic nerve were found at the point of exit from the optic foramen, from which point the pathological process seemed to have spread to the other portions of the nerve. Here the maculo-papillary fibres, the paralysis of which had caused the characteristic scotoma, were so arranged that in transverse section they assumed the form of an ellipse with the longer axis vertical, the centre of which nearly coincided with the axis of the nerve. The fibres of the temporal half of the macula are from the nasal side of the centre of a transverse section of the nerve. The axis of the nerve does not coincide with the fibres most changed. The fibres of the "nuclear group" are situated on the temporal side of the axis of the nerve. The arrangement of the affected fibres present, in relation to the axis of the nerve, an asymmetry identical with that shown by the perimeter for the scotoma.

The fibres of the temporal portions of the papilla showed a grayish color on ophthalmoscopic examination, but their function was almost unimpaired during the months which preceded the death of the patient. This condition explains the cases in which pallor of the optic disc is found without visual disturbance.

At the bulbar termination of the optic nerve the microscope revealed a considerable diminution of the axis cylinders in the affected bundles. Further back these bundles also showed an increase in the number of nuclei of the neuroglia cells. The layer of nerve fibres of the retina were atrophied, and the ganglionic cells seemed smaller than normal. In the macular region they were, however, well developed.

In addition to the changes of the nerve elements, the sections showed inflammatory changes in the sheath of the optic nerve. Its connective tissue was hypertrophied, especially at a point a few millimetres behind the lamina cribrosa. A large vein at the orbital opening of the optic canal showed every sign of a severe periphlebitis.

The histological changes in the papilla explain directly the pallor of the external portion on ophthalmoscopic examination. An increase in the amount of cellular tissue in the lamina cribrosa increases the reflection of light from this membrane; the same effect is produced by diminution of the nerve element. Pallor of the temporal portion may also be accentuated by hyperæmia of the nasal portion.

VI.—**Report of a Case of Thrombo-Phlebitis of the Central Retinal Vessels with Necropsy**, by Dr. WÜRDEMANN.

A boy became suddenly blind in the left eye in January, 1893. Two weeks before this he had had an attack of measles, from which he had completely recovered at the time of the loss of sight.

Ophthalmoscopic examination revealed the existence of complete closure of the central vein. The optic disc and surrounding retina were apparently filled with extravasated blood. Following the direction of the nerve fibres, hemorrhages of a flame-like character were seen. The borders of the disc were blurred.

The absence of prominence of the optic disc, the sudden loss of sight, and the œdema of the macular region excluded the idea of neuro-retinitis. As the arterial circulation had not disappeared several days after the appearance of the visual disturbance, the diagnosis of embolism of the central artery was also inadmissible. The veins, too, were more engorged than in the case of embolism.

After iodide of potassium and tonic treatment for a month, the patient was again examined. The fundus of the eye had cleared up, and the position of the former hemorrhages was only recognizable by the characteristic gray color. The optic nerve was white and atrophied. In place of the arteries were found only white cords. The veins contained clotted blood.

One year later, violent attacks of glaucoma occurred. A new-formed membrane situated just behind the posterior surface of the lens prevented ophthalmoscopic examination. Enucleation was performed. Microscopic inspection revealed connective tissue formation in the vitreous near the lens. Under the microscope the ciliary region showed marked hyperplasia of connective tissue. The retina and the choroid showed connective tissue degeneration, the former sending out prolongations of connective tissue into the vitreous. Transverse sections of the optic nerve very clearly showed that the sudden loss of vision was due to a thrombo-phlebitis of the central vein. This process produced a perivasculitis which caused the optic atrophy by hypertrophy of the interstitial cellular tissue of that nerve. The artery was completely obstructed by a granular mass of degenerated white and red corpuscles, surrounded by a fibrous capsule. The vein was also obstructed with fibrous exudate containing only a small number of blood corpuscles.

The American Journal of Ophthalmology.

Reviewed by Dr. SULZER.

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1894.—Vol. XI., No. 1.

I.—Amblyopia from Suppression of the Visual Image,

by Dr. WALTER A. JOHNSON.

At the last session of the American Ophthalmological Society Dr. Johnson reported an interesting case of convergent strabismus, in which the deviating eye, which was amblyopic (vision for fingers at 6 feet), had regained its normal vision in nineteen days after the loss of the non-deviating eye, the acuity of which had been normal (see *Annales d'Oculistique,* Vol. CX., p. 198). The author had occasion to examine another case of this description. A man thirty years of age had had an inward squint in the right eye since his youth. He had been operated upon at the age of seventeen years, the result of which was that the former permanent squint had become periodic. In August, 1893, the left eye was seriously injured by a piece of iron, which made a penetrating wound of the cornea 10 millimetres in length. At that time, vision in the right eye was found to be $\frac{20}{70}$ without improvement by glasses. Three days after, vision in the right eye had become $\frac{20}{20}$; that is, normal. In the left eye a traumatic cataract formed. Large characters could not be read with the right eye, formerly the deviating one, previous to the injury. It was not until the 12th of September that, after continued improvement, Jaeger No. 1 could be read at a distance of 10 feet. At this time the left (injured) eye counted fingers at a distance of 4 feet. On the 21st of September the patient complained of lack of certainty in walking and difficulty in localizing objects. It seemed that the occlusion of the left eye improved the symptoms. Despite its weak acuity (fingers counted at 4 feet), this eye seemed to interfere with the function of the other.

II.—Exophoria, by Dr. DUNN.

Miss X——, forty-seven years of age, had been troubled with her eyes since she was sixteen years old. Reading or any kind of fixation at a short distance caused severe headache which would last thirty-six hours. She was subject to frequent attacks of hysteria. There were, among other symptoms, severe and obstinate muscular spasms, and two extremely painful points, one situated at the top of the head, the other at the nape of the neck. The eyes, which showed a hypermetropia of 0.75 D., were normal. In 1893 reading had become impossible. After reading a few minutes, everything became as black as night. Such attacks disappeared in one or two minutes, only to recur when the patient again attempted to read. The retina was so sensitive that a short ophthalmoscopic examination produced a headache which lasted for several days. Abduction was 7°, adduction from 10 to 12°. The effort necessary to overcome a prism of 12° brought on nausea, which lasted for some time. There was an exophoria of 3°.

Headache was produced every time that the patient tried to do any near work. But resting the eyes did not completely cause the disappearance of this trouble. On one occasion, after several days of comparative ease, the patient, having dictated letters, received friends, and listened to reading, had a headache in the evening, which became very intense before morning, as she spent the night comparing mentally the notes of a piece of music from a sonata which she knew by heart with a later composition. This mental effort caused an intense headache, which lasted thirty-six hours.

These headaches were always accompanied with painful sensations in the eyes. The author thinks this combination always indicates the existence of ocular trouble, which in this case was represented by the exophoria.

Vol. XI., No. 2.

I.—**Sub-conjunctival Injections**, by Dr. Alt.

The author has made numerous sub-conjunctival injections with a 1 to 1,000 sublimate solution in the dose of two minims, with varying results, without ever having had disagreeable accidents. Numerous experiments have convinced him that injections of water or boric acid have no curative effect.

The most successful result was obtained in a case of double recurrent iritis. The patient, twenty-eight years of age, had been treated for five years by the most renowned oculists, who had administered atropine, salicylate of soda, and prolonged mercurial treatment. Each attack lasted from three to six weeks. On the 13th of January, 1893, a sub-conjunctival injection was made in the right eye, which had been attacked four days previously with a severe iritis, which had increased in spite of the ordinary treatment. The night after the injection the patient slept well for the first time. On the next day all the synechiæ were broken, and the pupil was dilated to its maximum. The patient resumed his occupation. Five weeks later an attack of iritis in the left eye was treated in the same favorable manner, with a sub-conjunctival injection of sublimate. Since that time—that is, thirteen months—the patient has had no more attacks.

If, in the different varieties of iritis, the results are not always as successful, they are certainly superior to those obtained by the ordinary treatment. In severe irido-choroiditis the duration of the disease is considerably shortened by sub-conjunctival injections of sublimate. This treatment is equally applicable to exudative choroiditis and central retino-choroiditis. At first the author feared to make injections in cases where there was considerable inflammation, supposing that it would increase it. Experience has taught him that, instead of increasing, injections of sublimate diminish, the pain in these cases.

II.—**A Petrified Eye,** by Dr. LYDSTON.

In 1886 a fossil of the form and size of a human eye was found at the mouth of the Knife River, on the northern shores of Lake Superior. Two sections made by a lapidary revealed the principal membranes of the eye, infiltrated with the crystalline matter. The anterior chamber seemed to have contained a hyphemia. The author concludes that this was probably the eye of a saurian of the carboniferous era (labyrinthodontes).

Vol. XI., No. 3.

I.—**Does Hyperopia Bear a Causative Relation to Strabismus?** by Dr. C. M. HOBBY.

The author severely criticises the theory of Donders, which explains convergent strabismus of hypermetropia as strabismus produced by the excess of convergence necessitated by the hypermetropia. While recognizing the relative frequency of hypermetropia in persons with convergent strabismus, he recalls the facts no less established that the great majority of hypermetropes are not strabismic, and that a large proportion of persons with convergent strabismus are not hypermetropic; also that hypermetropia may be associated with divergent strabismus. He considers, then, the relation between accommodation and convergence as acquired, being established and modified according to the needs of binocular vision. The author refers strabismic deviation to a disturbance of binocular vision, for it is the latter which produces the proper positions of the eyes. When this is at fault, two things may occur: A convergent impulse goes from the cortical visual centre to the two eyes, and the eye stops when the fixed point falls in the centre of the central fossa, while, for the eye which does not take part in binocular vision, this arrest is defective, whence convergent strabismus. In other cases, the eye excluded from binocular vision does not receive the convergent impulse—divergent strabismus. The dependence of the exact position of the eyes on binocular vision may be demonstrated by the following experiment: When one looks at a star, one eye being covered, double images are perceived at the moment that the hand is withdrawn from the covered eye. The false image will immediately move, ordinarily in a curved direction, to unite with that of the fixing eye.

II.—**Corneal Transplantation; the Cause of Failure, and the Remedy,** by Dr. W. J. COLE.

The article of Dr. Cole contains the description of an operation which has never been performed, for evident reason. The author proposes to transplant the cornea of an animal, preferably of a dog, in its entirety, and to attach it to the eye of the patient by the aid of four conjunctival flaps, after having resected the entire opaque cornea. The piece to be transplanted would have the form of a Greek cross with triangular branches. The crossing of the branches to be occupied by the cornea to be transplanted. The cornea to be put in place of the resected cornea, and the four conjunctival flaps fixed with a suture to the sclerotic, previously denuded of its conjunctiva in a manner corresponding to the shape of the flap.

III.—**The Action of Hydrochlorate of Scopolamine,** by Dr. T. R. POOLEY.

Experiments lead the author to different conclusions on several points from those stated by Dr. Raehlmann on the action of scopolamine (see *Annales d'Oculistique,* Vol. CXI., p. 411, and Vol. CX., p. 63). The latter thinks highly of scopolamine in corneal suppurations, and the absence of an increase of intra-ocular tension after its instillation in eyes menaced with glaucoma, or subject to a slight increase of tension, he regards as qualities which favorably distinguish it from atropine, which it surpasses as a mydriatic, while it is less toxic for the conjunctiva; also on the general ground of economy. Three patients for whom Dr. Pooley had prescribed a 1 to 500 solution of scopolamine, to be instilled in the same way as a 1 to 100 solution of atropine, presented serious toxic symptoms. One case is reported in full: A young girl, thirteen years of age, was seized with violent delirium after the instillation of six drops in each eye. The pupils were fully dilated, and the lips and muscles of the face were tonically contracted. The pulse varied from 120 to 130, and the heart action was very rapid and irregular. Walking was impossible. There was no sensation of dryness in the throat.

In a case of serpiginous ulcer it was necessary to replace the scopolamine with atropine, on account of the excessive irritation which it produced. In a case of traumatic suppurative keratitis its action was, on the other hand, excellent, and in numerous other cases of corneal affections it was satisfactory.

Vol. XI., No. 4.

I.—**A Pigmented Band Crossing the Pupil,** by Dr. T. Murrell.

The author discovered in a woman twenty-three years old a pigmented band crossing the pupil a little below its centre. This band was of a brown color, identical with that of the iris. It was inserted into the borders of the pupil, dividing, just before its insertion, into three separate bands on the nasal side and two on the temporal.

Vol. XI., No. 5.

I.—**Visible Circulation in the Retinal Vessels in a Case of Thrombosis of the Central Vein,** by Dr. S. C. Ayres.

A patient forty-eight years old suddenly lost the sight of the right eye during an attack of gout, after having had several attacks of temporary blindness in this eye on the preceding days. When the eye was examined, nine days later, the pupil was found greatly dilated. There was perception of light only in the lower external quadrant of the visual field. With the ophthalmoscope, the classical picture of thrombosis of the central vein was seen. In the neighborhood of the optic disc, by carefully observing the secondary branches of the retinal veins, the motion of the blood column was easily seen, which was interrupted at different points by white spaces. In the arteries there was no motion of the blood visible.

One week later, the veins were still more distended, but all motion had ceased. The œdema of the retina had diminished. There was still perception of light.

II.—**Albuminuric Neuro-Retinitis in Pregnancy and Its Treatment,** by Dr. L. R. Culbertson.

After describing a successful case, the author insists on premature delivery in serious cases of albuminuria in pregnant women.

III.—**A Case of Puerperal Albuminuric Neuro-Retinitis with Enormous Amount of Exudation; Recovery; Subsequent Pregnancy and Parturition at Term without Anæmic Symptoms,** by Dr. Alt.

The author was called, in 1891, to a patient twenty-six years of age, on account of a marked diminution in vision. The patient had been delivered two weeks before of a strong and healthy child. Vision had begun to diminish two months and a half before delivery. One month before she had had a violent attack of convulsions, and during the last week her legs were swollen. Delivery had produced no convulsions. Vision was $\frac{8}{100}$ in the left eye, and $\frac{14}{200}$ in the right. With the ophthalmoscope, the entire fundus of the eye except the most peripheral portions was silvery white. The diagnosis was clear without examination of the urine. In August, 1892, only slight traces of the former ophthalmoscopic picture were found: irregular pigmented patches in the region of the macula, pallor of the disc, and contracted retinal vessels. In March, 1893, a second delivery without accident. No albumen in the ninth month of pregnancy. (The ophthalmoscopic picture corresponds perfectly with a malarial poisoning. This supposition would better account for the later behavior of the disease.—SULZER.)

Vol. XI., No. 6.

I.—**Foreign Bodies in the Orbit,** by Dr. JOHNSON.

(See *Annales d'Oculistique,* Vol. CXII., p. 140.)

II.—**Headaches,** by Dr. O. LANDMAN.

The author attempts to determine the character and behavior of headaches dependent upon an uncorrected error of refraction. According to him, migraine is only rarely caused by error of refraction, even when it is accompanied by this. It is especially uninterrupted headache which is caused by some ocular defect. It is more frequent in women than in men, and may generally be localized. Uninterrupted diffuse headache is usually caused by a general disturbance. If the patient complains of headache in the eyes, or of pain extending from the eyeballs to the head, or surrounding the eyes after work, or situated behind the eyeballs, or of exasperated attacks in the evening, in general, of painful symptoms yielding to repose, it is probable that the cause resides in the eyes. The author thinks that it is refraction, and not a lack of equilibrium of the motor muscles of the eye, which produces headache. Two hundred cases of ocular headache present the following subdivisions of localization: eyebrows, 41%; top of the head, 20%; occipital, 12%; occipital frontal, 8%; temporal, 8%. In a single case, the headache was general. The fore-

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Vol. XI., No. 7.

I.—**A Case of Suppurative Panophthalmitis Following Discission of a Capsular Opacity,** by Dr. THEOBALD.

Reabsorption of a double zonular cataract had been brought about by repeated discissions, which had only once produced a reaction greater than usual. In spite of all antiseptic precautions, discission of a capsular opacity in the left eye produced a violent panophthalmitis. The patient was forty years of age.

II.—**Can Albuminuric Retinitis in Pregnancy Be Prevented?** by Dr. R. L. CULBERTSON.

Dr. Culbertson refers to the case published in No. 5. He attributes the successful results obtained to the administration of bichloride of gold.

The Ophthalmic Review.

Reviewed by Dr. V. MORAX.

January and February, 1894.

On Blinding of the Retina by Direct Sunlight: A Study in Prognosis, by GEORGE MACKAY, F.R.C.S.E.

The detailed observations of Dr. Mackay are preceded by a complete historical review, commencing with Galen, including the Byzantine emperor, Constantine VII., Galileo Galilei, Reid, Professor at Edinburgh (1761), Baron Larrey, and Mackenzie of the present ophthalmological era.

Every one to-day knows the characteristic macular affections which may follow direct observation of the sun, and which are especially noticed after solar eclipses. The eclipse which was visible at Edinburgh June 17, 1890, and a partial eclipse on June 6 of the following year, were the cause of the seven cases on which the author's article is based. He states that smoked glass does not form sufficient protection.

March.

On a Rare Form of Bullous Conjunctivitis, by Mr. G. A. BERRY.

Mr. Berry has observed upon the tarsal conjunctiva of the upper lids marked stellate cicatrices of "dermatitis herpetiformis" in the case of a man who was attacked one year before with herpetiform dermatitis, and who also had cutaneous scars.

April.

I.—Localized Posterior Staphylomata; Distortion of the Retinal Vessels, by Mr. RAYNER D. BATTEN.

Circumscribed ectasiæ of the sclera are found not only on the nasal side, but also above and below. They almost always produce an appreciable diminution in vision, especially when they are on the nasal side. This fact is explained by considering the displacement of the retina, which would be greater in the case of a nasal than in that of a temporal ectasia.

II.—Local Ocular Therapeutics by Sub-conjunctival Injections of Sublimate, by Dr. A. DARIER.

May.

A Case of Traumatic Exophthalmus, by Mr. A. OGILOY.

The author reports a case of a man who six months before had been thrown down and tossed by a bull. The two eyes were atrophied, as the result of traumatic rupture of the sclera, but on the left side there was also exophthalmus, caused by a fracture of the orbital walls.

Ogiloy has collected the different cases of traumatic exophthalmus, and shows that the cause is not always the same.

June.

I.—Primary Melanotic Sarcoma of the Eyelid, with Report of a Case, by Mr. W. Zummerman.

Cases of primary melano-sarcoma of the lid are very rare. The author has only been able to find five cases reported. In the case which he describes, the patient, fifty years of age, presented on the left lid a tumor of dull bluish color, one centimetre in length, and of oval form. It reached to the lid margin, but made no impression on the conjunctival surface. The skin was adherent, but not eroded. The tumor had commenced six months before. It was excised, and later a plastic operation was performed. Eighteen months after there was no recurrence. On microscopical examination the tumor was found to be a melanotic spindle-celled sarcoma, incompletely encapsuled, the point of origin of which remains in doubt.

II.—On the Etiology and the Surgical Treatment of Trachoma, by Dr. Pignatari (Naples).

July.

I.—On an Instance of Hereditary Glaucoma and Its Causes, by Mr. Priestley Smith.

Cases of hereditary glaucoma and of glaucoma attacking several members of the same family have frequently been noticed, but only hypothetical explanations have been given. In the case which Mr. Smith reports, the hereditary glaucoma depended on hereditary smallness of the eyes.

J. B.——, fifty-two years of age, was attacked with absolute glaucoma in both eyes. The horizontal diameter of the cornea was 10.5 millimetres. His daughter, twenty-five years old, had absolute glaucoma in the right eye, which necessitated enucleation, and thus gave the opportunity of making exact measurements of the eyeball. There was chronic glaucoma in the left eye, which improved after an iridectomy.

The enucleated eyeball was 3 millimetres smaller in all its diameters than a normal eye. The corneal diameters were 2 millimetres shorter than ordinarily. The lens, on the other hand, was relatively larger. Its horizontal diameter was 9 millimetres, its antero-posterior, 6.5 millimetres, while in the normal eye the diameters are 8.5 millimetres and 6 millimetres.

II.—The Inclinometer in Ophthalmology, by Mr. Arthur E. Prince.

August.

I.—Criticism Concerning Recent Views as to the Secretory Function of the Ciliary Body, by John Griffith, F.R.C.S.

The experiments of Deutschmann, Ehrlich, Schoeler and Uhthoff, Leber, Leplat, Memorsky, and others have sufficiently demonstrated that the formation of the aqueous humor takes place in the ciliary region. Nicati gives to the ciliary portion of the retina, as well as the adjacent pigment epithelium, the name of "gland of the aqueous humor." Treacher Collins has described, in the folds of the ciliary zone, glandular cul-de-sacs to which he ascribes the secretion of the aqueous humor. Collins' researches are interesting from the fact that he studied bleached sections. The section was treated with chlorine, which decolored the pigment, and thus allowed a perfect analysis of its histological structure. The glandular tubes described by Collins arise from an error of interpretation. When a horizontal section of the eyeball passing through the ciliary processes is made. it is very difficult not to cut obliquely several folds of this process. The intervals left between the folds then appear in the section like glandular cul-de-sacs. This appearance is still more marked when in its state of post-mortem rigidity the ciliary muscle exaggerates the folds of the corresponding zone.

For this reason Collins states that in the folds of the ciliary body the glands are attached one to the other. The tubular and pyriform glands described by Collins exist at the junction of the plicated with the non-plicated portion of the ciliary body, but they are very few in number. They are formed by the pigment epithelium, and not by the cells of the *pars ciliaris retinæ.* Griffith says that these glands are instrumental in forming pigment. They are more abundant in dark-colored eyes; in blue eyes, they exist, but are not so well developed; they are not found in the eyes of albinos, and therefore Nicati, who experimented on albino rabbits, did not describe them. This is also a proof that they are not instrumental in the secretion of the aqueous humor. Nicati admits that exudations from the chorio-capillaris, which is included between the internal vitreous membrane and the intervascular membrane of Sattler, should be directed toward the ciliary region, and there, by a process of metabolism, be transformed into aqueous humor.

Greef has observed that on performing a paracentesis of the anterior chamber of a rabbit's eye, and immediately afterwards examining the ciliary process, the cells covering this process are found distended with a coagulated fluid similar to that which is found in the anterior chamber immediately after its evacuation. Griffith has confirmed this fact on human eyes removed a short time after a penetrating wound, and he considers it as an exaggeration of the normal process of secretion.

II.—**Descemetitis,** by Dr. HERMAN SNELLEN.

In two cases of descemetitis in which an increase of tension had necessitated sclerotomy and paracentesis the author found small, short bacilli in the aqueous humor. In one of the cases, a gelatin culture of the bacilli was made. Snellen gives no details of the appearance of the cultures, or of the pathogenic action of. the bacilli. On the other hand, he draws a somewhat premature conclusion that cyclitis is due to the action on the ciliary body of the toxine of bacilli developed in the anterior chamber.

September.

Three Cases of Strabismus with Anomalous Diplopia; Normal and Acquired Point of Fixation in the Same Eye, by Mr. Charles Hermon Thomas.

The existence of a new point of fixation in a squinting eye has been described by Swanzy, Berry, and others. In five cases which Thomas reports there were two centres of fixation : one corresponding to the macula and used in monocular fixation ; the other, acquired, which only functionated in binocular vision. Two of the cases were divergent squint, and the third a convergent squint. Operative treatment gave a perfect result from a cosmetic standpoint, but not from an optical standpoint. After tenotomy, there was diplopia corresponding to the newly acquired point of fixation. The author concludes : 1st, that binocular vision is a different cerebral function from that of monocular vision ; 2d, that the corresponding points of the two retinas in binocular fusion correspond with the functional point of fixation, and that this point may, or may not, correspond with the fovea ; 3d, that suppression of the macular image in binocular vision may be produced because the macular image only has its usual predominance in monocular vision; 4th, that the existence of an additional point of fixation in strabismus is revealed by the fact that when the affected eye is used alone fixation is central, and that if a prism correcting the deviation is placed before the eye the patient complains of diplopia contrary to the rule (crossed diplopia with convergence, etc.).

November.

I.—The Relation of Blepharitis and Ametropia; Analysis of 100 Cases, by Mr. Clarke.

From his statistical researches made at the London Ophthalmic Hospital, Clarke concludes that blepharitis is essentially a disease of childhood, and that when it is seen in adults it has lasted since childhood. It is the expression of asthenopia caused by ametropia in every case (in 100 cases of blepharitis Clarke only found one emmetropic eye).

Correction of the ametropia is an important point in the treatment of blepharitis. Local treatment is of advantage, but recurrences are the rule if the ametropia is not corrected with glasses.

II.—New Method of Treating Vascularization of the Cornea, by Mr. KENNETH SCOTT.

This method, which the author considers superior to peritomy, consists in incising the vessels penetrating in the cornea with a Græfe knife with longitudinal, not transverse, sections in the cornea. The operation is performed with the aid of a lens. In some cases Scott has cauterized the vessels with a fine point, but the results were less satisfactory than those which came from longitudinal incision.

III.—Cellulitis Following Mule's Operation, by Mr. S. STEPHENSON.

The case was that of a child ten years old, whose eye, lost from a traumatism, was the seat of pain and intermittent redness. The author performed evisceration of the eyeball, and put inside a small glass sphere and sutured the sclerotic. Four or five days after, signs of infection appeared, discission of the sclerotic wound, phlegmon of the orbit. Stephenson admits that the infection might have been produced at the time of the operation.

IV.—A Case of Probable Lesion of the Ophthalmic Ganglion, by Mr. J. TAYLOR.

V.—The Therapeutic Value of Ice in Ophthalmic Surgery, by Mr. McGILLIVRAY.

December.

I.—Muscular Advancement in Strabismus, by Mr. R. WILLIAMS.

The author recommends advancement with or without tenotomy of the antagonist. The method which he employs consists of making a horizontal incision in the conjunctiva, seizing the tendon on the hook, then passing the thread in the conjunctiva to traverse the tendon perpendicularly, and finally bring it out in the conjunctiva in the neighborhood of the cornea. The tendon is then sectioned at its insertion, and the threads are given to an assistant, while the operator performs a tenotomy of the antagonist. Then the threads are carefully tied. After the operation, the eye should appear to deviate in the opposite direction from the primary deviation, otherwise the effect will be insufficient.

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Centralblatt für Praktische Augenheilkunde

Summarized by Dr. V. MORAX.

September, 1894.

I.—A Case of Recurring Retrobulbar Neuritis, by Dr. A. MOLL.

The patient is a young man of fifteen, without hereditary predisposition, who in January, 1890, showed signs of retrobulbar neuritis of the right side, pain accompanying movement of the eyeball, color-blindness for red and green, diminution of vision (counted fingers at three metres), without contraction of the field of vision, moderate papillary projection, and venous stasis. Cure in one month, without loss of visual power and without scotoma. Six months later, appearance of the same symptoms in the left eye, then cure in a few weeks. In April, 1891, August, 1893, and July, 1894, new relapses in the left eye, and each time a perfect cure. The papillæ show, however, an atrophied color, but strength of vision normal.

Moll compares this case with recurring idiopathic paralysis of the third pair.

October.

I.—Congenital Affections of the Cornea, by Dr. K. L. BAAS.

Baas reports observing three brothers who showed, at birth (as their parents said), corneal trouble, synechia of the iris, and a high degree of hypermetropia, exceeding 10 D. in two of the patients.

Tchender, Manz, and other authors claim, in explanation of these cases, an intra-uterine inflammation comparable with inflammations which supervene during extra-uterine life.

But Baas does not believe it a case of purely accidental inflammation ; he thinks that these inflammatory lesions preserve a certain teratologic character or anomaly of development.

II.—Clinical Contributions to the Study of Neuro-Paralytic Keratitis, by Dr. R. KUTHE.

The first observation relates to a man of forty-one, who, following cranial traumatism, shows paralysis of the right sixth nerve, of the right olfactory, of the hypoglossal, and of the trigeminus of the same side. Eight days after the traumatism slight superficial trouble with the cornea developed in the right eye, with complete anæsthesia of that membrane. Six weeks later, when the patient appeared at Hirschberg's clinic, there was evidently ulceration of the cornea with iritis without hypopyon.

Kuthe remarks that infiltration of the cornea at the beginning develops under the influence of traumatism and xerosis. During eight days the eye was not covered, and spasm of the lids was less frequent. Later, the affection did not differ from an ordinary ulcer of the cornea.

The second case is that of a child of four years, who, after a fall upon the head, showed paralysis of right sixth nerve, with paralysis of the trigeminus. The child already showed ulceration of the cornea, which, under the influence of fomentations, healed rapidly. The eye remained healthy for a year, then a new attack appeared, which healed as before, under the same treatment.

III.—A Modification of the Operation for Ptosis,
by Dr. Max Peschel.

The author, having to operate on a case of paralytic ptosis accompanying total ophthalmoplegia, merely passed three slightly divergent threads beneath the skin, running on one side into the tarsal cartilage and on the other stopping in the eyebrow, so as to utilize the action of the frontal muscle. The threads were left in place twenty-four hours, and the effect was very satisfactory.

November.

I.—Exudative Choroiditis and Pediculated Polypoid Tumor of the Choroid Simulating Glioma, by Dr. Ginsberg.

A child of three showed signs of glioma of the retina in the left eye. The eye was enucleated, and a detachment of the retina was evident. The choroid showed, at its posterior pole, a small tumor the size of a lentil. Histological examination showed the existence of nodular inflammatory tissue with giant cells, centres of fatty degeneration. The writer describes at length five lesions of the retina and the vitreous humor, but does not speak of any search for tuberculous bacilli, which would have been much more interesting. The idea of a bacillary lesion resulting secondarily in exudative choroiditis does not seem to have suggested itself to his mind.

December.

I.—Accommodative Paresis Treated with Behring's Anti-diphtheritic Serum, by Dr. Schmidt-Rimpler.

Schmidt-Rimpler has treated three cases of accommodative paresis following pharyngeal diphtheria with injections of the anti-diphtheritic serum of Behring. In the first two cases, accommodative paresis accompanied by paralysis of the velum of the palate had lasted three weeks. Cure was complete fifteen days after injection in one case, and in nine days after in a second. The third case is that of a man of twenty-four who appears to have had pharyngeal diphtheria in August; some days later he experienced symptoms of accommodative paresis. In the beginning of September the paresis was already on the way to improvement when an injection of the serum was given. Cure was complete seventeen days after the injection.

The cure seems to have been a little quicker than usual, but the writer does not think he should commit himself on the efficacy of the serum in these cases of diphtheritic paralysis.

II.—A Case of Monocular Diplopia with Double Pupil, by Dr. Hirschberg.

Hirschberg has been able to test the experiment of Scheiner on a patient with polycoria of traumatic origin, and showing no disease of the crystalline lens or its surroundings. At a distance, and when the healthy eye is closed, diplopia exists, with the images placed alongside each other; they are crossed, and the angle of divergence is a quarter of a degree.

The eye is hypermetropic, and when this is corrected diplopia no longer exists. It is true that in a case of polycoria diplopia only manifests itself when the eye is not focussed on a fixed object.

III.—Reduction of the Pupillary Reflex on the Right Side, with Reduction of the Pupillary and Accommodative Reflex of the Left Side, by Dr. O. Schwartz.

The case is that of a man of twenty-five, without syphilitic antecedents, and without cerebro-medullary affection, showing inequality in the pupils. Exposed to light, the right pupil is most dilated, and reacts but feebly to the luminous impression. The left pupil reacts strongly to light.

In darkness the left pupil is most dilated, and contracts but little in convergence or accommodation. According to Heddæus, the iritic branch of the oculo-motorius arises by two roots, one coming from the nucleus of the sphincter, the other from the nucleus of the accommodative nerve. In this case there may be admitted congenital weakness of the right sphincter nucleus and of the left accommodative nucleus.

IV.—**Echinococcus of the Orbit,** by Dr. H. Rabinowitsch.

Dieu and Weeks have collected thirty-three cases of echinococcus of the orbit, and Russian literature contains four other cases. It is, then, of rare occurrence. The case was that of a woman of sixty-four, who, for six months, had had disturbance of vision of the left eye, with exophthalmus and orbital pains. The left eyeball is immovable and pushed toward the upper orbital wall. The exophthalmus is so great that the eyelids no longer cover the cornea, which is so little transparent that no examination of the interior of the eye is possible. Sensation to light remains. Below and outside the eyeball can be felt through the eyelids a hard, immovable tumor, apparently fluctuating in spots, and filling the orbit. Considering the rapid growth of the tumor, the diagnosis was that of malignant tumor, and its extirpation was proceeded with. Beneath the conjunctiva was found a sac adhering so strongly to the eyeball and filling the orbit to such an extent that complete extirpation was found impossible. It was only advisable to remove the anterior third and plug the cavity of the cyst with iodoform gauze. The internal surface of the wall of the cyst was smooth, except for a vesicular projection in its posterior part. The liquid in the cyst contained no albumen. The walls of the vesicle were formed of an investing membrane in regular concentric layers, characteristic of echinococcus.

After the operation the eyeball returned to its place, and transparency returned to the cornea. There was atrophy of the papilla without trouble of the media. The patient counted fingers at a distance of two metres; the motility of the ball is very limited.

Klinische Monatsblätter für Augenheilkunde.

Summarized by Dr. V. Morax.

November, 1894.

I.—**Practical Advice for Young Oculists on the Operation for Cataract.**

Pagenstecher fears lest different opinions on the subject of operation for cataract should mislead young ophthalmologists, and lest, in face of different methods of procedure, they should hesitate at a choice. This is the advice he gives to his assistants : Do not operate upon a patient with even a slight inflammation ; make certain that there does not exist near the eye, in the lachrymal ducts, a source of contamination for the wound made in operating ; examine with care the state of the other eye, and do not interfere in case there are signs of irritation ; if that be atrophied or painful, it should be enucleated, and six or eight weeks should elapse before the operation on the other eye.

If iritis, or glaucoma, or other pathological symptoms exist in the other eye, wait for the return of a normal condition. Do not operate for immature cataract nor without disinfecting the parts involved, the hands, and the instruments. Lift the eyelids with an elevator easily removed. Fix the eye near the cornea. Do not make the incision too peripheral above, and preserve a small bridge of the conjunctiva. The cut should not be too short—about a third of the circumference of the cornea. The perfect linear section is not advisable. Practise iridectomy before incising the capsule. Dividing the capsule from the front is to be preferred, and the capsular forceps should only be employed in a case of strongly marked capsulary cataract. Force out the crystalline lens by pressure on the lower side of the cornea, and evacuate the cortical masses by slight pressure on the cornea, or by manipulating the cornea beneath the eyelid. Do not wash out the anterior chamber. If the vitreous humor escapes before opening the capsule, remove the lens with the scoop. This procedure may be followed from choice when the cataract is over-mature and the patient is very docile. Bandages should be sterilized. Do not make discission of the secondary cataract until irritation has subsided, but then, as soon as possible. Do not introduce the needle into the cornea, but into the limbus at about one millimetre back of the cornea.

II.—On Disease of the Eye Induced by Intestinal Worms,

by Dr. C. MEURER.

In two cases noticed by Meurer, children of eleven and five years, respectively, there was rapidly progressing loss of vision accompanied by headache and vomiting, and characterized by slight optic neuritis with papillary stasis. Ten days after the attack of blindness vision commenced to return, and in both cases recovery coincided with the evacuation of intestinal worms. The writer thinks that he can attribute the cerebral hyperemia and the hydrocephalus which, as he believes, were the cause of the optical neuritis, to a reflex(?) action from the mucous membrane of the intestines.

December.

I.—A Contribution to the Study of the Pathological Anatomy of Polypoid Growths of the Conjunctiva, by Dr. W. Zimmermann.

Zimmermann describes three cases of pedunculated growths of the conjunctiva :

Case I.—Child of twelve years, treated in 1894 for phlyctenular keratitis, which with yellow ointment healed rapidly. In May there appeared on the lower palpebral conjunctiva a small papillomatous neoplasm, without ulceration and without inflammation of the surrounding conjunctiva, supported by a short pedicle.

Microscopic examination of this little excrescence revealed granular tissue with giant cells, covered by a continuous layer of epithelium.

Coloring by Ziehl's fuchsine showed three tuberculous bacilli in one of the large cells. The child presented no other manifestations of tuberculosis, and Zimmermann thinks that it may be a case of ectogenous infection, possibly induced by the applications of the ointment.

Case II.—A man fifty-seven years of age wounded the lower tarsal conjunctiva slightly by a straw. At this point a small papillomatous excrescence gradually developed, which finally gave rise to a slight ectropion with conjunctivitis. A year later a tumor of gelatinous consistency was found, of reddish color and irregular surface, and attached by a short pedicle in the neighborhood of the lachrymal puncture.

Histological examination showed that it was a papilloma. At many points the epithelium showed calcified deposits.

Case III.—A child eleven years of age was subject to repeated and free hemorrhages of the conjunctiva. On the tarsal conjunctiva, near the external angle, a small papillary tumor with irregular surface and short pedicle.

This tumor was formed of fibrous tissue with well-developed blood vessels. The stratified epithelium by which it was covered was in many points calcified. It was a vascular fibroma.

II.—Injections of Iodine in Detachment of the Retina, by Dr. Schoeler.

Schoeler replies to the article of Wolff (*Arch. f. Ophthalm.*, Bd. XLVII., p. 62). This author has shown experimentally that injection of tincture of iodine in the vitreous humor, far from provoking adhesions between the retina and the choroid, produces lesions of the vitreous, and may cause ultimate detachment. But Schoeler has never recommended the injection of iodine into the vitreous humor. In his article in 1885 he expressly says that the tincture of iodine should be injected in the pre-retinal space between the detached vitreous body and the retina. Six years' clinical experience has not altered his views. Inflammatory adhesions may be obtained either with iodine or galvanism.

Schoeler then gives the results of the five cases reported in his article of 1889 (Operative Treatment and Cure of the Retinal Detachment). In the first case the cure lasted for four years, but two years ago the patient was lost sight of. The second case was operated upon for cataract two years ago, and vision is better than immediately after the treatment of the detachment. In the third case senile cataract developed, and the vision has diminished ; this should be attributed to progressive chorio-retinal atrophy. In the fourth case a cataract developed, and a lacuna persisted in the visual field corresponding to the seat of the detachment. The fifth patient has not been seen for five years. At that time the cataract was well developed, and prevented examination of the fundus of the eye.

III.—**Associated Movements of the Upper Lid in a Patient with Coloboma of the Optic Nerve,** by Dr. HILLEMANS.

Hillemans reports the case of a patient eighteen years old, with a slight ptosis of the left upper lid without paralysis of its movements.

In this patient, opening the mouth, adduction and abduction of the inferior maxilla were accompanied with a synchronous movement of the upper left lid.

January, 1895.

I.—**Etiology and Treatment of Glaucoma,** by Dr. O. WALTER.

Scopolamine has been recommended as a mydriatic which does not increase intra-ocular tension, and an attempt has been made to substitute it for the ordinary mydriatic in eyes predisposed to glaucoma, but the number of cases applicable to this treatment is limited. Raehlmann, Illy, and Martelli state that scopolamine does not increase the tension, while Belliarminow is more reserved. Walter reports a case of irido-choroiditis in which instillation of scopolamine seemed to provoke an attack of glaucoma : the patient had had, several years before, a glaucomatous attack in the other eye. In the second case there was choroiditis without increase of tension. Instillation of scopolamine brought on an attack of glaucoma which necessitated iridectomy. It is proper, then, to be as circumspect in prescribing scopolamine as in the case of other mydriatics. In the first case Walter obtained marked improvement with an anti-gout treatment (piperazine, warm baths, etc.), although the patient showed no pronounced signs of the uric acid diathesis.

II.—**Bilateral Gumma of the Orbit, with Autopsy,**
by Dr. O. Walter.

Walter describes the case of a child three and one-half years old in whom an exophthalmus, at first monocular, later bilateral, developed quite rapidly. The exophthalmus became so marked that the cornea was uncovered, and ulcerations resulted, which brought about the destruction of this membrane and purulent disintegration of the eyeball. A hard tumor was felt under the eyeball, reaching to the summit of the orbit, and continuing forward under the skin of the cheek. Soon the tumefaction extended to the temporal and frontal regions. At the same time there was emaciation and marked disturbances of the general condition. Death followed two months after the commencement of the exophthalmus. Diagnosis made during life was that of a malignant tumor of both orbits, and treatment had been purely symptomatic.

At the autopsy, sclero-gummatous lesions of the capsule were found, and in the liver and kidneys, in the diaphragm and pleura, and gummas of the peri-cranium and dura mater. The orbital tumor was composed of periosteal gummas, without change in the underlying bone, which invaded the periosteum of the superior maxillary of the frontal and of the temporal bones.

III.—**Pemphigus of the Conjunctiva,** by Dr. Glas.

Glas publishes three cases of pemphigus of the conjunctiva accompanied with general pemphigoid eruptions of the skin and mucous membranes.

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Summarized by Dr. VALUDE.

November, 1894.

I.—Mechanism of the Action of Iridectomy in Glaucoma, by Dr. DE VINCENTIIS.

The author begins by opposing the hypothesis of the filtration cicatrix explanation of the cure of glaucoma after iridectomy. We are not sure, he says, of the action of this so-called filtration cicatrix, and the argument regarding it is purely hypothetical. For himself, he thinks that in a case of glaucoma iridectomy acts by the direct action which it exerts on the angle of the iris. When, he says, iridectomy is practised and no synechia exists, the operation has a double effect besides the section made in the membrane of the iris; the entire iris is distended, and a certain amount of traction is exerted on the angle itself, so as, in a certain sense, to produce a spreading apart. It is by these tractions that iridectomy produces a curative effect, and this is so true, says Dr. de Vincentiis, that iridectomy ceases to be efficaceous if synechiæ exist which limit the distention.

To give experimental proof which will sustain this hypothesis, the writer treated glaucoma by simply detaching the angle of the iris by means of a blunt instrument introduced at the periphery of the anterior chamber. Success rewarded his attempt.

II.—Syphilitic Retinitis with Albuminuria, by Dr. E. BERGER.

Observation of specific, classic retinitis, with the circumstance that it coexisted with a chronic nephritis.

January, 1895.

Salicylate of Soda in Exophthalmic Goitre, by Dr. CHIBRET.

The author cites four cases of *Basedow's disease* much improved by use of salicylate of soda; this disease is sufficiently rebellious for us to note with satisfaction any remedy that can affect it favorably.

Dr. Chibret gives the salicylate in doses of five grammes per day, at least, and improvement follows in a few days. However, the medicine should be continued for a considerable period, unless contraindicated by the appearance of morbid symptoms.

To avoid any disadvantages of the salicylate, Dr. Chibret recommends that it be given four times in twenty-four hours, and in at least a half-litre of liquid; however, if desired, the dose can be reduced from five grammes to two.

IV.—BOOK NOTICES

MEDICAL JOURNALS

Sebaceous Eczema of the Eyelid, and Its Treatment, by Dr. LELOIR. (*Bulletin méd.*, January 20.)

The first stage is characterized by the formation of scales, white, small, pityriasiform, and generally traversed by hairs; little or no itching.

At the second stage there is congestion, moisture, formation of scabs and crusts, gluing the eyelashes, and causing, when detached, superficial excoriations. Loss of eyelashes, styes, suppurative folliculitis. The lashes readily return.

In the third stage, more pronounced dermatitis, palpebral œdema, either generally or limited to the neighborhood of the free border. The lashes are no longer reproduced, for they are destroyed by follicular or peri-follicular inflammation.

At the fourth stage the dermatitis is deeper, with cicatrization and thickening of lids, lashes destroyed or growing irregularly in every direction. Entropion or ectropion.

As for the eye itself, there were found conjunctivitis, congestion, redness, pricklings, hypersecretion of a whitish appearance; in very pronounced cases, kerato-conjunctivitis, ulcers and maculæ on the cornea, pannus, etc.

Treatment: Treat the seborrhœa of the scalp, for it is contagious, and the palpebral seborrhœa is only a complication by inoculation. For the eyelids, resorcin lotions; one or two teaspoonfuls of a liquid solution of resorcine $\frac{1}{30}$ in a half a cup of hot infusion of chamomile, with application morning and night of weak resorcin ointment or

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Recurrent Hemorrhage of the Retina, by Dr. TROUSSEAU.

(*La Clinique opht.*, January, 1895.)

The writer has observed a patient who showed recurrent hemorrhage of the retina, and for which none of the usual causes of hemorrhagic retinitis existed. There was neither sugar nor albumen in the urine, and no heart trouble. A complete examination of the urine showed the existence of uric acid and phosphates ; appropriate treatment lessened the tendency to hemorrhage, which has not reappeared since the urine approached the normal.—V.

Retinitis of Paralytics ; Histological Notes, by Dr. COLUCCI.

(*Annali di neurologia*, 1894, sheets 3-4.)

The greater number of cases of restriction of the field of vision, of loss of visual power, and of all the other ocular troubles so frequent in paralytics, result from true anatomical lesions. Clinical varieties of ocular difficulties in paralytics, as well as the principal trouble itself, must depend upon the location in which the lesions first and with greatest intensity develop ; these varieties depend as much on the variations of the elements which compose the different physiological zones invaded, on the communicating tissues invaded, and on the seat of the obstructed lymphatic ducts.

As to the alterations of the retina in paralytics, three principal anatomical varieties can be distinguished.

First, the commonest and the most characteristic consists in primitive atrophy of the nervous elements of the retina in general, independently of any vascular lesion, and the irregular and variable distribution of the lesions into the nuclei, interspersed among which may be found parts of the retina comparatively well preserved.

The second consists in a predominant alteration of the vessels under the form of an extraordinary proliferation of the fibres and the nuclei of the vascular walls, and finally in the consecutive obliteration of their canals.

The third form is the slowest but the most regular in evolution. This is rather a case of secondary degeneracy, with alterations of the optic centres, and by this very symptom the lesion resembles that provoked experimentally in animals by resection of the optic nerve. —BITZOS.

Anterior Sclero-Choroiditis, by Dr. ABADIE.
(*La Clinique opht.*, January, 1895.)

The author studies the disease characterized by attacks of scleritis, accompanied by various troubles of the cornea, which may extend to a rather intense yellow infiltration. The affection is mostly noticed in women, with frequent recurrence, corresponding to the menstrual period. Dr. Abadie thinks that the yellow deposits in the cornea may really be deposits of urates, because the disease essentially resembles an affection of a gouty nature. In fact, the preferable treatment is neither by mercury nor iodide of potassium, but by colchicum.

Two or three granules of colchicum should be prescribed, in doses of a milligramme each, but that dose should not be exceeded. But if in any case signs of intolerance, shown by colic, become evident, they must serve as a warning. The medicine should be given in alternate periods of eight days of rest and eight days of employment; iridectomy will be useful if there be synechia.—VALUDE.

Epithelioma of the Eyelid Treated by Methyl Blue,
by Dr. FAGE. (*La Clinique opht.*, January, 1895.)

The author reports three cases of epithelioma of the eyelid successfully treated by applications of methyl blue in strength of $\frac{1}{10}$.

Even extended epitheliomas can be cured by this method. To expedite a cure, a part of the neoplasm just at its base of implantation can be excised, then the exposed surface should be touched with chemicals; or, after having destroyed the canceroid formation with the hot iron, the treatment can be continued by application of methyl blue.—VALUDE.

A Case of Tenonitis, by Dr. PUECH. (*La Clinique opht.*, January, 1895.)

The case is one of tenonitis offering the two following peculiarities: there existed together with protrusion of the eyeball complete paralysis of the upper eyelid; the second noticeable point is that the patient was recovering from an acute blennorrhagia, which suggests the hypothesis of a gonococcal origin of the disease. Exposure to cold had been so great that this, by itself, might have been claimed as a cause.

Treatment of Suppurative Disease of the Cornea by Sub-conjunctival Injections of Parachlorophenol, by Dr. DOLGANOFF. (*Wratch*, No. 23, 1894.)

The author has made a series of observations on the use of parachlorophenol (liquid solution of 1–2%) in sub-conjunctival injections for the cure of ulcers of the cornea.

These injections are generally easily supported; they result in only slight pain, which lasts for five minutes, and no other complications are observed. The author applied this treatment in six cases of ulcer of the cornea of traumatic origin; the ulcers cleared up and healed rapidly (seven to sixteen days); the injections favorably influenced the progress of serpiginous torpid ulcers which resisted the usual treatment. Moreover, the injections of parachlorophenol had the advantage of lessening or completely doing away with the pain. Though the observations were few in number, the author, notwithstanding, concludes: 1st, injection of paraphenol undoubtedly hinders the spread of suppuration, and considerably hastens cicatrization; 2d, the injections are also recommended on account of their prophylactic action.—MUTERMILCH.

Operative Treatment of Conjunctival Xerosis, by Dr. ANDOGSKY. (*Wratch*, No. 13, 1894.)

In five cases of xerophthalmus due to old trachoma the author applied with success the procedure recommended by Dr. Roudine at the fifth Congress of "The Society of Russian Physicians," consisting in a suture of the free borders of the lids, except in their medial part. In two cases not only did the disagreeable sensation of dryness disappear, but vision was considerably improved; in two other cases improvement was also noticed, but the observation was not carried further; finally, in the fifth case, one of a long standing xerosis, disappearance of the sensation of dryness was observed, but no improvement of vision resulted, owing to the presence of leucoma of the cornea. Such satisfactory results as these from following the process of Roudine induce the author to recommend a larger application in the treatment of xerophthalmosis.—MUTERMILCH.

ANNALES D'OCULISTIQUE

Volume CXIII.—Number 3.

MARCH, 1895.

I.—ORIGINAL CONTRIBUTIONS

MEMOIRS

CLINICAL AND ANATOMICAL STUDY OF SEROUS OR SIMPLE CYSTS OF THE CONJUNCTIVA

By Dr. **G. ROMBOLOTTI**,

Former Assistant at the Ophthalmological Clinic of the University of Pavia.

Observations relative to serous or simple cysts of the conjunctiva are few in number, and, therefore, according to the statement recently made by Panas in his treatise (1), their pathogenesis is yet imperfectly known.

I have no intention of making a classification of these cysts; nevertheless, it has seemed proper, in order to determine the histogenesis of a case of serous cyst of the conjunctiva which came under my observation, to make the following division:

A first variety is composed of those which are situated on the bulbar conjunctiva, and which are of congenital as well as of spontaneous origin.

Saemisch (2) says that these cysts are generally situated near the corneal margin; that usually they are not movable under the mucous membrane, which latter enters into the composition of their walls. They are round in form, with a thin, delicate wall of almost perfect transparency, allowing the contents, clear as water, to be seen. Such was the case described by Saemisch.

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(1) PANAS : Traité des maladies des yeux. Paris, 1894, Vol. II., p. 281.

(2) GRÆFE-SAEMISCH : Handbuch der Gesamm. Augenheilk., Vol. IV., No. 1, p. 157.

Cysts have been seen, on the contrary, by some authors, with thick walls which are not movable and are deeply adherent to the episclera (1). Others have noticed that the cyst was movable under the conjunctiva, with which it formed hardly any adhesions. (The Case of Warton-Jones, reported by Mackenzie) (2).

It is difficult to determine the histogenesis of this first variety of cysts. The authors above mentioned do not discuss it.

A second variety, which has its seat on the bulbar conjunctiva near the corneal margin, and with almost the same morphological characteristics as those of the first variety, is composed of those which may be traced to a traumatic origin. The cases of this variety recorded in literature are likewise few in number; among the best known, I refer to those of Arlt (3), Schön (4), Zehender and Geisser (5), Uhthoff (6), and Baudry (7). The cases published by Uhthoff deserve special attention, as this author discusses the important question of the histogenesis of these cysts.

In the first of these cases the cysts occurred after an operation for advancement of the external rectus performed for a convergent strabismus. Five weeks after the operation the cyst was visible over the tendon of the advanced muscle, as a small transparent swelling, 3 to 4 millimetres in height, and about 4 millimetres distant from the corneal limbus, intimately adherent to the sclera and covered in its upper third by the tendon of the advanced muscle. Its contents were clear and serous. Anatomical examination showed that the wall of the cyst was composed of connective tissue which showed no peculiar disposition or stratification, and having a covering of pavement epithelium of a single layer. There was no trace of a foreign body either in the wall or in the contents of the cyst.

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(1) **Wecker** and **Landolt** : Traité Complet, Vol. I., p. 425.

(2) Diseases of the Eye.

(3) **Arlt** : Die Krank., Vol. I., p. 169.

(4) **Schön** : Pathol. Anat. des Auges. Hambourg, 1829, p. 166.

(5) **Zehender** and **Geisser** : Die Verletzungen des Auges. Leipzig, 1864, p. 416.

(6) **Uhthoff**. (*Berliner Klin. Wochenschrift*, 1878, p. 729.)

(7) **Baudry**. (*Bullet. Méd. du Nord*, 1882.)

In the second case described by Uhthoff, the cyst, which was also situated on the bulbar conjunctiva, followed a penetrating wound of the ciliary border of the upper lid, which recovered in eight days. Six weeks later, the cyst was present, and was of the size of a bean. The tumor was situated 1 centimetre from the external side of the limbus, in the conjunctival tissue of the eyeball; the conjunctiva was not movable on the wall of the cyst, but intimately connected with it; the contents were serous and transparent; on oblique illumination, three lashes were seen included in the wall of the cyst.

On histological examination the cyst wall appeared to be composed of conjunctival fibrillæ, which had no characteristic disposition, and which were covered internally with a layer of flat epithelial cells.

In the third case, the cyst occurred a few days after the bite of an insect. It was situated 8 millimetres from the internal corneal margin, and was of the size of a small pea, with clear serous contents and of an elongated cylindrical form.

After excision of the cyst, Uhthoff found a delicate pavement epithelium covering the very thin inner wall of connective tissue. There was no trace of vessels, yet the author thinks that this was certainly a dilated lymph vessel, which in consequence of its extreme dilatation had lost its proper vascular structure.

As regards the pathogenesis of these cysts, Uhthoff thinks that a study of the first two cases leaves no doubt that their formation was directly dependent upon the introduction of a lash in the sub-conjunctival tissue. He believes that it was the epithelial cells adherent to the eyelash which were drawn in and became the point of origin of the cystic formation.

In cysts with serous contents there is a suppression of the elimination of the fluid, and the included eyelashes act as foreign bodies.

The third case, according to Uhthoff, was by no means due to traumatism, but was simply a lymphatic dilatation.

As for the diagnosis of these cystic formations, Uhthoff thinks that a simple microscopical examination will show whether a conjunctival cyst is formed by the dilatation of a lymph vessel or otherwise, for cysts due to a vascular dilatation are situated in the superficial layers of the conjunctiva, and are always movable on the sclerotic; further, the course of a lymphatic vessel may frequently be followed, in the surrounding tissue, as a thin cord continued in the extremity of the cyst; and again, the form of these cysts is rather elongated than globular. Cysts of traumatic origin, on the other hand, according to Uhthoff, have their seat in the sub-conjunctival tissue; they are deep, and in consequence of the inflammatory reaction excited about them, they are firmly adherent to the sclera and to the superficial layers of the bulbar conjunctiva; they are consequently not movable on the mucous membrane.

A third variety of sub-conjunctival cysts includes those which are developed in the bulbar conjunctiva from dilatation of the lymphatic vessels of the mucous membrane. They are generally small, like a small transparent worm, or disposed in groups. These formations have been studied by Hirschberg (1). Panas (2) noticed that they were found both in irritated conjunctivæ and in those of normal appearance, and that they resemble lymphectasias. Although there still exist doubts as to their precise signification, he calls attention to the articles of Stenderer (3), Irme (4), Laskiewicz (5), and Delecueillerie (6), who give no less than nine personal observations, from which it is shown that these cystic cavities may be circumscribed and anastomose with each other; that they are situated under the conjunctiva, and that they generally contain a coagulable fluid. As for the walls, they are composed of a condensed laminated tissue covered with an endothelial layer which is not continuous.

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(1) *Klinische Beobachtungen*, Berlin, 1874, p. 1, Fig 2.

(2) Traité des maladies des yeux, Vol. II., p. 267.

(3) Wirchow's Archiv, 1874.

(4) *Wiener Med. Wochenschrift*, 1876.

(5) LASKIEWICZ. (Jaresbericht f. Ophthalm., 1877.)

(6) *Thèse de Paris*, 1892.

A fourth variety of cysts which deserves special classification is formed of those which are developed in the reflected portion of the conjunctiva. I find no mention of these particular formations in the two former principal treatises on ophthalmology (Græfe and Saemisch, de Wecker and Landolt). In the recent work of Dr. Panas (1) the cases of Faravelli and Rampoldi (2) and of Bull are reported (3).

It is to Professor de Vincentiis (4) and his pupils (5) that we are indebted for the important researches from which it appears that their development is due to a cystic dilatation of the acino-tubular glands of Krause. It must, however, be admitted that this interpretation, which is sound and rational in regard to the histogenesis of simple conjunctival cysts, is either not yet generally known or its proper value is not appreciated. Panas, in his excellent treatise, scarcely makes mention of it.

Antonelli (6) makes the following resumé of what is known up to the present time of these formations, which develop, as I have said, by cystic degeneration of the glands of Krause: they may be congenital (Faravelli and Rampoldi), but they are more frequently acquired (de Vincentiis, Moauro) (7).

Their origin is not uniform. It is sometimes due to an obstacle to the elimination of the secretion from alterations of the tissue which is traversed by the excretory canals, sometimes to neighboring tumors, which form mechanical impediments, and sometimes to modifications in the quality and quantity of the secretion itself.

Its clinical aspect is that of a larger or smaller vesicle, situated in the upper cul-de-sac (rarely in the lower), which is prominent under the skin. It is situated between the lid and the osseous border of the orbital cavity, along the orbito-palpebral furrow, which becomes obliterated, or even gives place to an elevation. On everting the lid its form is seen to be that of a concavo-convex meniscus interposed between the eyeball and the lid. The cyst has the appearance of a more or less tense vesicle, which allows an examination of its contents, sometimes limpid and clear, more frequently of a brownish color. The conjunctiva which covers it is hyperæmic, as well as the skin of the lids, but this is less marked when the cyst has attained considerable development.

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(1) *Loc. cit.*, p. 282.

(2) *Annali d'Ottalm.*, 1880.

(3) *Americ. Journal of Med. Sc.*, 1878.

(4) Congresso Associaz. Ottalm. Ital., Napoli, Settembre, 1888.

(5) MOAURO: Dilatazione cistica delle ghiandole di Krause. Raccolta dei lavori della Clinica Oculistica di Napoli, 1887-1888.—ANTONELLI: Cisti sottocongiuntivali aventi origine delle glandole acino-tubolari. (*Annali d'Ottalm.*, 1890.)

(6) *Loc. cit.*, p. 281.

(7) Cisti congiuntivali aventi origine delle ghiandole acino-tubolari. (*Annali d'Ottalm.*, 1890, p. 467.)

After this rapid review of the different varieties of simple cysts of the conjunctiva, I now present the case which came under my observation, and for which I am indebted to the courtesy of Dr. Denti, Director of the Ophthalmological Service of the Milan Hospital:

C. A——, twelve years of age, had been treated for a penetrating wound in the left eye, implicating the cornea and the sclera, with prolapse of the iris and the ciliary body. From the former clinical history it was found that the wound had taken a vertical direction from above downward, and that it occupied the internal superior third of the eyeball, or rather the segment included between the superior and the internal recti muscles. The child left the hospital after a period of acute inflammatory reaction, on the termination of which this note was made: "The eyeball is rapidly becoming phthisical." For four years the eye caused no trouble, until the month of November, 1892, when the child noticed that in the segment which had been injured a small transparent body like a small vesicle was developing, which in five or six months attained the size of a grain of wheat. There was a stationary period, and then from April, 1893, the vesicle slowly increased, arranging itself around the cornea. During this increase the tumor occupied the palpebral opening. The child stated that neither at the commencement nor during its later development did he suffer any pain, either ocular or periorbital.

On inspection, a swelling of the conjunctiva like an enormous chemosis was seen filling the palpebral opening. The lower lid seemed somewhat distended and slightly everted, as in ectropion. The swelling was of a pale rose color, almost white, with a gelatinous and pearly appearance. Its surface was traversed by large and tortuous blood vessels, which disappeared in the pale and anæmic fundus of the mucous membrane.

On everting the lids, it was found that the swelling exactly filled the lower cul-de-sac. At the internal angle, where the cul-de-sac was almost effaced, the swelling commenced outside the caruncle, at the semi-lunar fold, of which there was no trace. As this line of contact of the conjunctival cul-de-sac with the sclera was almost parallel to the corneal circumference, and as the conjunctival swelling extended to the corneal margin, it is easily seen that this swelling surrounded a large portion of the cornea. The swelling was almost perpendicular to the scleral surface, and attained the maximum elevation at the middle of the space included between the lower cul-de-sac and the corresponding corneal margin. The form of the entire swelling was that of a crescent with the concavity turned upward ; it surrounded the two lower and internal thirds of the cornea.

All that portion of the cornea from below upward which was surrounded by the conjunctival swelling was the seat of a large cicatrice; in its upper external third only, a small portion of tissue about 3 millimetres in size, situated along the peripheral margin, still preserved a certain transparency which revealed a segment of atrophic iris, adherent to the extensive and flattened corneal cicatrix.

On lateral illumination, nothing worthy of mention was noticed, but the transparency of the conjunctival swelling suggested a serous exudation.

There was no question here of an inflammatory chemosis from the absence of any active process of infection.

The excellent health of the patient and the limitation to a clearly defined zone of the bulbar conjunctiva gave no foundation for a diagnosis of a spontaneous œdema of the conjunctiva, such as is sometimes seen in persons who are weak or anæmic, or after certain important physical states (cardiac or renal affections, or repeated pregnancy).

The former injury might have led to the diagnosis of a cyst of traumatic origin, provided that it was not a question of a simple serous cyst.

On the subject of the differential diagnosis of simple conjunctival cysts, Saemisch (1) explains that in marginal fistulæ of the cornea which have a conjunctival covering a swelling of the mucous membrane may develop near the corneal margin, having a certain resemblance to a conjunctival cyst; however, the diagnosis is reached on considering their position and other alterations in the eye.

Wecker (2) in this connection says that "one should not confound this with blind fistulæ of the cornea, or with a cystoid cicatrization of a circumscribed wound of this region, which differs appreciably from cysts, which are very rare."

I was inclined to accept this interpretation, having confidence in these authors, and directed my treatment accordingly, convinced that it was only by a histological examination of a portion of the tissue forming the conjunctival swelling that the problem could be solved in a definite manner.

The following was the treatment pursued: The conjunctival swelling was perforated with a Pravaz syringe, and it was at once noticed that the needle encountered no resistance. On delicately withdrawing the piston, I succeeded in drawing off a half-syringe full of almost transparent fluid. The swelling then completely subsided. With a Græfe knife, I incised it through its entire thickness and extent in a direction parallel to the border of the lower lid, making the section fall in the middle of the space included between the lower fornix and the corresponding corneal margin; I then excised three portions, one parallel to the horizontal portion of the section, and two other smaller ones vertically at each side, which were at once prepared for histological examination.

I found immediately after cutting off these flaps that the cyst had absolutely no adhesions with the scleral tissue, the surface of which presented nothing which might explain a serous exudation from filtration of the endocular fluids. I carefully examined the point where the prolapse of the ciliary body existed, and which I have already mentioned in the objective examination of the patient. But here also there was nothing abnormal.

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(1) Handbuch der ges. Augenheilk., Vol. IV., No. 1, p. 149-50.

(2) Traité compl. d'Ophtalm. de Wecker and Landolt, Vol. I., p. 424.

I immediately sutured the two conjunctival flaps, in order to cover again the denuded scleral surface.

After a few days, the child left the hospital completely recovered.

Microscopic examination of the fluid withdrawn from the cystic cavity.—The fluid withdrawn from the cystic cavity was put into a small tube and allowed to stand for twenty-four hours, after which a thick gray sediment was found at the bottom. The fluid, which at the time of extraction was of a slightly opaline color, was now perfectly transparent.

Microscopical examination of the sediment demonstrated that it was composed of leucocytes of various sizes and somewhat changed; some were swollen, hydropic, and almost disorganized; some were pigmented, with grains of black pigment in the protoplasm; endothelial cells were also seen like those in the walls of blood vessels and lymph spaces, some flattened and lamellar; there were also epithelial cells of rounded or of rectangular forms, with a distinct nucleus and a finely granular protoplasm; lastly, there was a protoplasmic residue resulting from the decomposition of white corpuscles in the fluid.

Anatomical examination of the excised tissue.—Anatomical examination showed that this was formed by the conjunctival mucous membrane with the characteristics pertaining to that which covers the eyeball. In the epithelial layers were found a number of cells with changes due to degeneration of the mucous membrane.

The connective tissue situated underneath, and which forms the proper tissue of the mucous membrane in its most superficial part, scarcely differed from the normal structure. It simply appeared to be hypertrophied, and was somewhat thicker than usual. In connection with this condition of hypertrophy the calibre of the blood vessels was larger than in the normal condition.

In the network of which this connective tissue is composed there was seen an infiltration of lymphatic elements, but it is known that this infiltration has been described as constant and normal by many histologists. I have never, however, seen typical lymphatic follicles. It was only in the deeper portions that the supporting connective tissue of the mucous membrane assumed a peculiar form—that is, it was more crowded together and less infiltrated with lymph corpuscles. The fibres, which were more regularly arranged, united in bundles, and more frequently placed longitudinally, were arranged in layers in uniform manner, precisely as is seen in conjunctival formations, which compose the supporting stroma of the epithelial covering of cysts. The most characteristic fact revealed by the histological examination in relation to the clinical diagnosis was that this conjunctival zone, having the form of a small band, was continued in an epithelium, formed of a small number of layers composed of very much compressed cellular elements. In some parts of the section the epithelium was formed of two layers of cells; in other parts, however, perhaps from the obliquity of the section, three or four layers were seen. The deepest layer, which was contiguous to the connective tissue, was always formed of cubical cells with a large, well-defined nucleus; the more superficial, on the other hand, were composed of larger cells, more flattened, almost lamellar, but always having an easily recognizable nucleus.

The histological examination, therefore, proves that this was only a simple or serous cyst of the conjunctiva. I did not remove fragments from both walls, but only a portion of the superficial wall corresponding to the surface of the conjunctival mucous membrane, in the stroma of which the cyst had evidently developed, and the deep wall, in contact with the sclera, was left in its place, whence it disappeared, probably from the manœuvres performed during the excision.

As for the pathogenesis of this serous or simple cyst of the conjunctiva, it seems to me that there is no connection between the former traumatism of the eyeball and the cystic formation.

Indeed, Uhthoff (1) concludes from the study of the cases which he examined, in which this connection was evident, and to which I have referred, that the commencement of the development of the cyst should take place within a short time after the traumatism. But, in my case, three years had passed since traumatism before the patient noticed this new change in the eye.

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(1) UHTHOFF. (*Loc. cit.*)

Neither the clinical examination nor the anatomical study of the specimen revealed any of the signs which Uhthoff describes as characteristic of cysts of traumatic origin. Indeed, the cyst had formed no adhesions with the sclera, and neither eyelashes nor other foreign bodies were found in its walls, so that no traumatic origin could be traced.

The existence of the large cicatrix in the cornea and sclera, with prolapse of the ciliary body into this, might have suggested the idea that, instead of the cyst, this was a sub-conjunctival serous infiltration, following alterations in the cicatrix. But, as I had rejected this idea for reasons given above, could I then admit a direct connection between the traumatism and the formation of the cyst? And in which of the varieties above enumerated should it be classed?

The patient stated that the first manifestations of the cyst appeared at that portion of the eyeball which was formerly injured, and that it was only later that this formation extended around the cornea. I am inclined to think that the patient was mistaken in these observations, for objective examination demonstrated that the conjunctival swelling exactly filled the lower cul-de-sac, and extended to the corresponding corneal margin.

It then seems evident that the origin of the cystic formation was in the lower cul-de-sac, and that by extension the cyst caused the swelling of the bulbar conjunctiva about the lower half of the eyeball. I should then conclude that the pathogenesis of the cyst was related to a cystic degeneration in a small excretory canal, or in a cluster of Krause's glands, which are known to exist also in the lower cul-de-sac. Indeed, the histological characteristics of the cyst wall strengthen this view, and especially the characteristics of the lining epithelium, which was composed of two or three layers of cells, and in some parts of a greater number, perhaps, on account of the obliquity of the section.

The lining epithelium, peculiar to cysts developed by dilatation of an excretory canal of Krause's glands, is, indeed, composed of two layers of cells; on the other hand, in cysts which are developed by dilatation of one of the acini, the layer of lining epithelium is single; this disposition is in relation to that of the epithelium of the excretory canal and of the acini, which are in two layers in the first, and in a single layer in the second.

If, in my case, the number of epithelial layers of the cyst wall was three and four, it does not follow that the preceding opinion should be rejected, for independently of the obliquity of the section, it is known that the epithelium of glandular ducts frequently undergoes thickening about the orifice of the duct into the cul-de-sac, which increases the layers to three, and sometimes to four.

In opposition to the histogenesis which I have given, there is an objection, which is, that the cyst developed in the inferior cul-de-sac, instead of in the superior. Indeed, Antonelli (1) states that the relative frequency, not to say the exclusive possibility, of cysts in the superior fornix is justified by the fact that here Krause's glands are most numerous (8 to 20), and are frequently crowded in a space of a few millimetres, while in the lower fornix, they are very few in number (2 to 4), and are separated from each other. (Ciaccio: *Osservazioni intorno alla struttura della congiuntiva umana.*)

The same author states that the case of Bull (2) was the only observation of cystic dilatation of Krause's glands in the lower fornix, but says that this is not conclusive, as there was complete absence of anatomical research.

However, if the clinical history alone is considered, I think that the second case described by Bull in his work, which corresponds to that published by Faravelli and Rampoldi (3), should be referred to a cystic degeneration of Krause's glands.

In conclusion, I think I may say that the cyst which I examined was due to a dilatation of an excretory duct of one of Krause's glands. It is not possible to discover the precise cause which determined this dilatation.

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(1) *Loc. cit.*
(2) *Loc. cit.*
(3) *Loc. cit.*

A differential diagnosis between a real cyst of the conjunctiva and a sub-conjunctival serous exudation formed by infiltration through a cicatricial cystoidal tissue situated near the corneal margin cannot be easily made from clinical facts, as Saemisch says (1). It can only be made after anatomical examination.

Cysts resulting from dilatation of the acino-tubular glands of Krause may develop in the lower fornix of the conjunctiva, and by spreading upward, they lodge in the sub-mucous connective tissue of the bulbar conjunctiva, which aids in the formation of the supporting stroma of the walls of the cyst. After the development of the cyst the swollen bulbar conjunctiva assumes a peculiar aspect by reason of the serous and transparent contents of the pocket, so that in some cases the cystic formation may be confounded with a simple conjunctival effusion produced by filtration of the intra-ocular fluids through a faulty cicatrix. As the conjunctiva enters into the formation of the cyst, the latter is not movable under the mucous membrane, and therefore the differential diagnosis is somewhat difficult.

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(1) *Loc. cit.*

THE WORD "ASTIGMIA."—ASTIGMIA AFTER CATARACT OPERATION.

By Dr. **GEORGES MARTIN.**

The word *astigmia* is, in my opinion, preferable to *astigmatism*. It is shorter; this is an advantage which will be appreciated in a work of some length if the word occurs many times. But this is a secondary reason, although I have stated it first. If this were the only reason, it is probable that I should never have proposed this new word. The abbreviation *As.*, well known to the medical profession, suffices to economize the time of authors and the paper of editors. There are two other reasons of real value which have led me to substitute the word *astigmia* for *astigmatism*.

The latter word is derived from the Greek ἀ, privative, and στίγμα, a point. In forming it, the Rev. Dr. Whewel wished to recall the physical fact which determines this visual anomaly. When the rays emanating from a luminous *point* penetrate an eye whose cornea or lens has a greater refraction in one direction than in the perpendicular direction, they do not form an image of a *point* on the retina, but figures in the form of lines, ovals, or rounded spots are obtained.

But our English colleague, in choosing the substantive to enter into the composition of the word which he wished to form, committed an error: στίγμα, ατος, does not mean a point in the sense in question. By consulting Greek dictionaries of all periods, it will be found that it signifies *puncture*. This is the origin of the word stigmata, which is used, for example, in speaking of the wounds made in the hands and feet of Christ by the nails which held him to the cross. To designate a luminous point, one should have recourse to στίγμή, ἧς, which means the mathematical point. This word requires the termination *ia*, which is found in such words as aphonia (ἀ, φωνή, without voice).

Before launching this word in the scientific world, I desired the approval of competent Greek scholars. I therefore consulted various scientists, among them M. Ouvré, the erudite professor of the Bordeaux Faculty of Letters, and M. Monnier, one of the most distinguished members of our law faculty, devoted for a long time to the special study of ancient languages. They all found this new-born word without original taint and well fitted to live. With such protectors, the fortune of the word is well assured.

The second important motive in favor of the substitution which I propose is this: Various words serving to designate either instruments for measuring asymmetry of refraction or conditions related to this anomaly are really derived from στίγμή, and not from στίγμα. With the latter word, the instruments would not be spoken of as *astigmometers*, but *astigmatometers*. But the first of these two words is the only one used. The expression *astigmogenic contraction* has been used for a long time to designate the partial contraction of the ciliary muscle which produces an asymmetry.of refraction. This expression has been in use by many of my colleagues. But the word *astigmogenesis* is also derived from στίγμή.

Variations in the Degree of Astigmia after Cataract Operation.

It has been long known that the astigmia which follows cataract extraction requires a certain time, ordinarily three months, to disappear. When this period of time has elapsed the astigmic degree found has been supposed to be definite. Hence the rule of conduct which operators enforce in their practice: to order temporary glasses immediately after recovery from the operation, and to replace them after the fourth month by glasses better suited to the condition of the refraction.

Various facts have led me to conclude that it is at times necessary to change even these latter glasses. As I stated in a small volume of the Charcot-Debove library, with the title *Myopia, Hyperopia, and Astigmia*, "I have noticed quite curious changes in three patients operated upon for cataract. One of them presented for three years an astigmia of 3.25 dioptres. What was my surprise, one day, to find, without any other concomitant phenomenon than a recent reduction of vision, a diminution of 1.75 dioptres in the amount of astigmia, the proper correction of which re-established the former vision."

In a fourth case, after having witnessed first an increase in the amount of astigmia, I have then observed a progressive diminution of the amount. This case, I think, merits publication.

M. X——, seventy-five years old, was operated upon by me for cataract in the right eye on May 13, 1892. The operation was performed by extraction by a small flap combined with iridectomy. During the first five days all went well, so that the patient obtained permission to rest several hours in a chair. On the sixth day, during the absence of the attendant, the patient concluded to wash his face with cold water. A few hours after this imprudence the eye became inflamed. In the evening, I found it red, painful, lachrymating, and the anterior chamber filled with blood. After this accident, recovery was retarded and vision was inferior to what it should have been. The blood which escapes into the eye had induced an inflammation of the lens capsule, and a secondary cataract followed. Vision on the 10th of June was only $\frac{2}{6}$. The degree of corneal astigmia was high, a fact which is always observed when the wound does not close by first intention.

I give the figures which were found at the various astigmometric examinations made in the six months following the operation :

June 10	6	dioptres.
June 28	4	"
July 23	3	"
July 27	2.50	"
September 7	2.50	"
October 6	2.50	"

It will be seen that at the end of July—that is, about two months and a half after the operation—a definite degree of corneal astigmia seemed to be established.

On the 15th of October I operated for the secondary cataract with Knapp's capsulotome. The operation was made under cocaine, and produced no pain. It was followed by no inflammatory irritation.

On November 3, examination showed that vision was almost normal.

On the same day, I found an increase in the degree of corneal astigmia. I give a table of the figures found up to the month of June, 1894:

November 3, 1892	3.50	dioptres.
November 14	3.25	"
November 23	3.00	"
December 8	3.00	"
February 7, 1893	2.75	"
April 5	2.25	"
June	1.50	"
June, 1894	1.50	"

The slight operation performed by puncture of the cornea, and not by incision, without the slightest interference with the iris, had caused an increase in the astigmia. On November 3—that is, eighteen days after the capsulotomy—I noticed an increase of one dioptre. It is probable that if an examination had been made a few days after the capsulotomy I should have found even a higher degree. I am led to think this from the fact that during the three weeks which followed this examination there was a clearly marked progressive diminution of a half dioptre.

To reach a degree in the neighborhood of that which existed before the capsulotomy, nearly six months were required. On April 5, 1893, the astigmia was no more than 2.25 dioptres. The reduction, however, had not reached its limit, for in June, 1893, the astigmia was 1.50 dioptre. From that time, there was no further change. In fact, the actual definite astigmia was not established in this patient until one year after the extraction of the cataract.

A CASE OF CARCINOMA OF THE CONJUNCTIVAL LIMBUS IN A CHILD OF FOURTEEN YEARS

By Dr. **ROGMAN,**

Physician-in-Chief to the Ophthalmic Institute of Ghent.

Case.—On December 27, 1893, L. M——, fourteen years of age, a native of T——, came to my clinic. On the corneo-conjunctival limbus of the right eye, in the lower internal region, was a small tumor which from its persistence had attracted the attention of the family physician, my distinguished colleague, Dr. St. Nicholas De Ryck. The tumor was of a yellowish-white color, 3 millimetres wide, 4 millimetres long, its greatest diameter being parallel to the limbus, and it was raised about 1 or 2 millimetres above the sclera. Its surface was slightly nodulated, but not ulcerated. It did not encroach upon the cornea, and was not movable when the conjunctiva was moved over the sclera. On its peripheral side it was surrounded by a slight superficial vascularization, which by its color contrast emphasized the pale yellowish tint. The tumor had been noticed for the first time one month and a half before this visit; the family, however, remembered that, for two years before, the eye became easily reddened by the wind or any other irritating cause. There was not and never had been pain in or about the organ; only for the last fifteen days the child had noticed, from time to time, a sensation like the prick of a pin. All the other portions of the eye were normal, and the function was regular. No ganglionic enlargements were found. There had never been an injury or any other noticeable cause which could have given rise to the disturbance. The child was in perfect health; he was the youngest of five children, the eldest of whom was twenty-six years old, all of whom enjoyed the best of health. The parents are still living, and have never had any disease. There was no antecedent history of tumors in the family.

The tumor was removed with a bistoury, the blade gliding along the sclera, and then the surface of implantation was energetically curetted.

The after treatment was very simple, and no complication occurred. The wound recovered without leaving any other traces than a slight spot of venous tint (thinning of the sclera from the grattage), which still persists.

Anatomical Examination.—The tumor was hardened in the chromo-osmic fluid of Flemming and imbedded in celloidin.

It was cut parallel to the surface. The sections, about forty in number and taken at different depths, were colored with safranine, and were divided into three series—superficial, median, and deep. The tumor had somewhat the form of a truncated cone flattened at the side, and by comparing the sizes of the sections it was easily seen what relative positions they had occupied.

The structural arrangement was the same in all of them: at the periphery, in almost the entire circumference, was a border formed of conjunctival epithelium; in the centre, the body of the tumor.

The conjunctival border was much wider at the two angular extremities of the section than at the sides, probably because the razor had encountered the conjunctiva in a direction more inclined to its surface. It was formed of pavement epithelial cells progressively smaller, more flattened, and serated near the periphery, more globular, and less exactly united in the deeper part. In some places the intercellular spaces were quite large; they formed actual vacuoles, where here and there were seen immigrated white corpuscles, assuming various forms and with filaments stretching from cell to cell; these filaments were very well marked in places: they formed what are known as intercellular bridges.

In half of the sections the epithelial layer was quite sharply limited from the subjacent tissue, but in the second half, it was prolonged in tracts into the tumor proper. These tracts were continuous there with cellular groups surrounded by bundles of connective tissue; the cells forming these groups had almost all preserved their more or less globular form, while some were slightly compressed; their nucleus was sometimes small, sometimes deeply stained, rounded or oval, and ordinarily quite regular. Intercellular bridges were here found.

In the second half of the sections the cellular groups had a different appearance: crowded together in the midst of an abundant connective tissue, the cells which composed them were pressed concentrically together; they were flattened, horny, and covered each other like the layers of an onion, and at the centre they completely lost their form and were replaced by an amorphous substance strongly colored by the safranine. In some places these horny cells were found not only near the amorphous central substance, but also at the periphery, the two layers being then separated by cells which had preserved to a greater or less degree their form with protoplasm and nucleus. The external horny layer sometimes surrounded two contiguous centres of degeneration (1). The epidermic globes thus formed were about twenty in number; they were situated, as I have said, for the most part in the sub-epithelial cellular tissue, but some were also found in the epithelial covering and in the complex tissue of the first half of the tumor described above.

The superficial layers were distinguished by the relative predominance of epidermic tissue. In the deeper layers the conjunctival tissue became more and more predominant. The portion of the sections which corresponded to the first half of the proper tissue of the tumor was formed of a reticular tissue in the meshes of which were found numerous white corpuscles. The epidermic globes penetrated to the deeper layers. Numerous newly formed blood vessels were found in all parts.

The anatomical diagnosis was then unquestionable. This was a commencing epithelial carcinoma of the conjunctival limbus.

Malignant tumors in the ocular conjunctiva, as well as in all other parts of the body, are proper to old age, and it is rare to see them appear before the age of forty (Panas). In studying the literature on this subject, I have only been able to find seven cases in younger patients: one case of Dujardin (a child of twenty months); two others of Panas (twelve, and thirteen and a half years); another of Keyser, in a young man nineteen years of age; that of Lagrange (Transactions of the French Ophthalmological Society, 1892, p. 81), occurring in a man twenty-seven years old, (epithelioma situated between the caruncle and the limbus); still another of Valude (Ophthalmological Society of Paris, December 1, 1891), in a man thirty-five to forty years of age (epithelioma of the limbus); lastly, the case of a man thirty-seven years old presented by Bousquet to the Anatomical Society of Paris, November 3, 1876 (encephaloid carcinoma).

The cases of Dujardin, of Panas, and of Keyser, from the ages of the persons in which they occurred, are the only ones which bear a relation to my case.

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(1) This diposition seems to me to constitute an argument in favor of the theory of Sgrosso concerning the genesis of the epithelial globes.

That of Keyser was published in *Zehender's Monatsblätter*, 1869 (Operative Beseitigung einer Cancroïdgeschwulst von der Augapfeloberfläche). The author gives no details of the result of histological examination, but merely states that the tumor was of cancroidal structure. A small cancerous tumor had previously been removed from the nose.

The case of Professor Dujardin was reported in the *Journal des Sciences Medicales de Lille*, 1885, p. 747, under the title of Sub-conjunctival Tumor of Epithelial Nature. A small tumor was found in the left eye of the child under the bulbar conjunctiva, perfectly movable, situated a short distance from the caruncle, and partly hidden by the lower lid, of a whitish color and the size of a small bean. The parents had only noticed the existence of this tumor for a few weeks. The child was in very good health. After excision, which was followed by a prompt recovery, a histological examination of the tumor was made by Professor Augier.

> This tumor, writes the latter, was of the form and size of a rather small pea, and of quite firm consistency; on section, the tissue was grayish and of uniform appearance. The tissue was easily teased apart with needles; microscopical examination of one of the small teased fragments showed that it was completely formed of a collection of epithelial cells analogous to the cells of the epidermis. These cellular elements were completely reduced to the condition of horny epidermic layers: the small thin plate which formed the cell was wrinkled, and the folds which gave it this appearance started from the centre, where the nucleus was represented by a clear space. There was no trace of living protoplasm in these living epithelial cells, as no reagent, neither aniline, carmine, nor osmic acid revealed it. This mass of epidermic layers was contained in a thin fibrinous capsule. Lastly, I must mention the total absence of capillary vessels in this neoplasm of such peculiar nature, remarkable on account of the age of the patient, its position, and its constituent elements.

The two cases of Professor Panas were published in his Traité des maladies des yeux, 1894, Vol. II, p. 295. In one, melanotic epithelioma of the limbus occurred in a child thirteen and a half years old. It was movable on the subjacent parts. The tumor had been noted in the form of a small black spot the size of the head of a pin at the age of one year. After the fifth year, it had increased progressively in volume until at the time of the operation it was the size of a bean. Histological examination revealed epidermic globes. In the second case, the child, twelve years of age, had in the upper external portion of the limbus a congenital nævus, noticed in early childhood, and which had later undergone malignant transformation with spreading character. The epithelial nature of the cell groups was diagnosed from their follicular disposition, the absence of vessels in their interior, and their transformation, in places, into mucous elements.

In fact, the only known cases of carcinoma of the limbus in early age are the first one of Panas and my own. The tumor described by Dujardin was not situated at the limbus. The second case of Panas, characterized by mucous degeneration, seems to approach that kind of neoplasm to which Parinaud (1) has given the name of dermo-epithelioma.

The nature of malignant tumors of the limbus has caused much controversy. Clinically, sarcoma is differentiated with difficulty from epithelioma. In an article which appeared in von Græfe's *Archives* (Zur Casuistik der an der Hornhautgrenze vorkommenden Carcinome und Sarkome) (2), Berthold gives the following differential diagnosis between these two tumors: 1st, in carcinoma the adhesion of the neoplasm to the cornea is more intimate on account of the greater thickness of the epithelial layer in the latter; 2d, the borders of the sarcoma are raised perpendicularly from the cornea and the sclera, those of carcinoma are inclined; 3d, the tissue of carcinoma is very delicate and fragile, that of sarcoma is of a firmer consistency. The literature of the subject shows, however, observes Heyder (3), that these characters are far from being constant. In my case there was concordance with the second symptom, but not with the third, as the tumor was dense and hard.

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(1) *Arch. d'Opht.*, 1884, p. 349.

(2) *Arch. f. Ophth.*, Vol. XIV., 3, p. 149.

(3) *Arch. f. Augenh.*, Vol. XVII., p. 413.

According to Panas (1), the structure of tumors of the limbus is more frequently mixed. "My personal researches," he says, "corroborated by published facts, have led me to the conclusion that in the majority of cases the neoplasm is epitheliomatous, with the addition of sarcomatous elements, especially abundant in epibulbar tumors of rapid progress and large size." If it is not always easy, histologically, to determine the exact character of each of the elements which compose these tumors, the anatomical diagnosis of the preparations may be established with certainty from a single valuable sign, which is rarely used in researches of this kind, although it is most frequently perfectly practical, especially after hardening in Flemming's solution, as has been pointed out by Dr. Vanderstricht, the obliging and learned chief of the University: I refer to the intercellular bridges. This sign shows that the degeneration is uniform; in places, indeed, where the epithelial type of the cells is less distinct the intercellular bridges remove all doubt.

It is proper to say on this subject that in my own sections the fibrillar radiations which surrounded certain elements gave them this peculiar appearance, which has caused them to be considered by several pathologists as parasitic elements. By comparing these elements with each other in different portions of the tumor, I am convinced that they are simply cells more or less modified by intercellular bridges, as has been stated by Ribbert (2).

In affections of the conjunctival limbus, the diagnosis which it is important to determine immediately is between malignant tumors, on the one hand, and benign tumors and inflammatory processes, on the other hand. When these disturbances are just commencing, there may be considerable difficulty in distinguishing them. Malign tumors may be mistaken for a papilloma, a pinguécula, a dermoid, and, above all, they are easily confounded with phlyctenular disturbances, especially when their principal differential symptom, that of age (1), is lacking. My case, however, proved, and this circumstance gives it a peculiar interest, that the presumptive diagnosis based on the persistence and the continued development of the process should suffice in cases of this kind to authorize and even to impose intervention. Indeed, the preservation of the eye may depend upon prompt and energetic action.

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(1) Panas: *Traité des maladies des yeux*, Vol. II., p. 285.

(2) *Centralbl. f. Allg. Path. und Path. Anat.*, V., p. 111.

The treatment of malignant tumors of the limbus has been the subject of numerous discussions in recent years. While some ophthalmologists advise immediate enucleation of the eye as soon as the neoplasm has been recognized, others are content with a local treatment, and do not concede the necessity of enucleation until the tumor has reached a certain size (Caspar) (2). Still others (Valude) (3) claim that epitheliomas of the sclero-corneal limbus, which, in general, have no tendency to extend either upon the cornea or the sclera, present rather the indications for local extirpation.

In support of his view Valude gives two examples which demonstrate how long a time the eyeball can resist the invasion of malignant tumors which develop on its surface. I have had a similar case. Every New Year I receive a visit out of gratitude from an old gentleman, J. van L., of L——, seventy-six years of age, from whom I removed, six years ago, with preservation of the eye, a cancer of the limbus of several years' duration, extending from the lower third of the cornea to the caruncle, and which had previously been treated by other oculists. I have been assured by these visits that up to this year there has been no recurrence, and that he retains his good health.

The case which forms the subject of this article is a new proof of the efficacy of local treatment,. for, since the operation was performed, more than a year has elapsed, the period of on which Lagrange considers necessary (1), and from which I receive from my colleague, Dr. De Ryck, no ;y to recurrence has yet manifested itself.

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(1) De Wecker : *Traité complet d'ophtalmologie*, Vol. I., p. 437.

(2) *Archiv. f. Aug.*, XXIV., 180.

(3) Soc. d'Opht. de Paris, Session of December 1, 1892.

n examination shows that the media of the eye are still tely exempt it is nearly always proper to try local extir- even when, according to Professor Knies (2), there has been a recurrence, as in one of my cases. But care be taken to remove the tumor as completely as possible shing the operation with the galvanic or thermo-cau- r rather with energetic curetting of the surface of im- ion. Knies and Sgrosso (3) draw over the neighboring ctiva and fix it to the operative wound. Although this e is formally condemned by Lagrange (4), I think that uld be guided according to the supposed nature, prog- nd extent of the affection, and that it is not necessary ematically renounce the advantages of a covering, at artial, of the wound, which the superimposed conjunc- n account of its slight thickness, does not completely om view.

leation of the eye should not be performed, especially early stage, until perforation or extended invasion of eloping membranes of the eye does not allow of simple n under favorable conditions, but demands complete re- of the neoplasm.

GRANGE : Transactions of the French Ophthalmological Society, 1892, p. 95.
IES : *Grundriss der Augenheilkunde*, 1888, p. 136.
IES and SGROSSO. (*Loc. cit.*)
GRANGE. (*Loc. cit.*, p. 92.)

CLINICAL NOTES

SUB-CONJUNCTIVAL OSTEOMA

By Dr. **GALTIER** (of Nimes).

Occurrences of this nature are very rare. No mention is made of them in the best known works upon the pathology of the eye, and it is only in the extensive treatise by de Wecker and Landolt that we find a short chapter upon this subject. Three cases are therein noted, and are as follows :

1st. A case of von Græfe.

This is that of a young girl who had long noticed a slight swelling of the upper lid (of which eye is not stated) and a sense of discomfort consequent upon the feeling of weight. Upon eversion of the lid a tumor about half the size of a walnut was found near the external commissure; it was oval in form, as hard as cartilage, had a neck-like prolongation, and was situated beneath the conjunctiva, which was quite normal in appearance. When removed, this hard portion was found to be formed of a much-thickened cellular tissue, and to enclose true bone tissue, and in its structure resembled an incisor tooth 3 millimetres in length.

2d. Saemisch's case.

This was a young man who had for some time been aware of a slight swelling under the upper lid of the right eye, which for several months had given a sense of discomfort. Under the bulbar conjunctiva between the external and superior recti was found a procidentia which extended to the cul-de-sac and was the size of a bean. This tumor was only slightly movable, was very resistant, and by its surface adhered extensively to the conjunctiva.

When the tumor was enucleated it was found to be extremely resistant, so much so that it was not possible to grasp it with the teeth of the forceps. Its upper surface was convex, and the lower concave surface rested upon the sclerotic. The two surfaces were merged in rounded borders. The length of this ovular tumor was 9 millimetres, and its thickness 3 millmetres ; it was composed mainly of bony tissue with a dense covering of cellular tissue.

3. A third case was noted in 1871 in de Wecker's clinic.

It was that of a young woman of twenty-six years, who, under the conjunctiva of the superior cul-de-sac of the right eye, had a very resistant tumor, which I can compare only to a slightly flattened date-stone. This tumor, which was $\frac{3}{8}$ of an inch in length, was not absolutely adherent to the eyeball, but was only slightly movable, because the conjunctiva had become fixed upon the middle portion of its anterior surface. It had developed very slowly, and caused but a slight projection beneath the upper lid, and a sensation of heaviness when the lids were separated. Its removal was easily accomplished, a strip of the conjunctival tissue being left adherent to the tumor. Microscopic examination showed that this mass, with its rounded anterior and flattened posterior surface, was composed of very dense cellular tissue, enclosing a perfectly organized osseous centre without any cartilage.

In my own practice the following case occurred about six years ago: A young girl from Beaucaire, ten years of age, large and robust, and apparently in perfect health, was brought to me on account of a peculiarity of the right eye of which she herself was quite unconscious. The upper part of the eye had become slightly injected, and her governess advised her to see a physician. The child felt no discomfort, and, had attention not been called to it, would not have mentioned the eye at all. When she turned the eye downward and inward a well-defined projection of the form and size of a slightly flattened pea was found at the equator of the eye, above the horizontal meridian and behind the equator. The corresponding portion of the raised bulbar conjunctiva was congested. This projection, which was somewhat resistant, was slightly movable upon the eye, but to a very limited extent, and it was evident that it adhered firmly to the conjunctiva which covered it.

As the tumor was somewhat large, and as its base was not united to the eyeball, I proposed its removal, and began by slowly making an incision in its long diameter, then endeavoring to separate it from the adjacent parts. It was, however, so firmly adherent that this proved too difficult of accomplish-ment. I then seized the mass with a toothed forceps, and, lifting it as far as possible, excised it by snipping with the scissors, and thus removed it from its celluло-mucous envelope. What was my surprise, upon dissecting it, to find its contents hard, absolutely osseous, and formed of very compact tissue. The bone had the general appearance of an oyster-shell, with a smooth and polished concave surface, which was applied to the eyeball, and an upper rough and knobbed convex surface which was very adherent to the bulbar conjunctiva. Its length was 1 centimetre; its breadth, 7 millimetres. I sent the specimen to the histological laboratory at Montpellier, hoping that the microscope would throw some light upon its nature. Was it a neoplasm or a portion of normal bone accidentally detached from one of the orbital walls? The reply which was given me was simply this, "This bony tumor appears to be composed of normal osseous tissue."

The question had the more naturally arisen in my mind because of a special feature of much importance in the child's history.

About six or seven months previously, toward evening, several boys gave chase to her, while others suddenly held a rope before her, so that she fell with violence upon her forehead, and so quickly that she was not able to protect her face by spreading her hands in front of her. She recalled the fact that it was the right side of her face and forehead, consequently the upper orbital border, which came in contact with the ground. The fall nearly stunned her, but by the next day she scarcely felt any effects from it, and was soon cured. Nothing at that time pointed to injury of the eye.

The results of the histological examination, which indicated that the bony tissue was absolutely normal, and the history of the recent accident, incline me to the belief that the bony tumor was accidental, and was composed of a fragment of bone detached from the orbital vault by a splintering following the blow upon the border of the orbit, the fragment becoming imbedded in the conjunctival tissue, and that it was not a tumor spontaneously formed in that situation.

The fact that six years have elapsed since the operation, and that there has been no return of the tumor, likewise militates against the idea of a neoplasm.

Still, my case is very similar to those already given in the history of sub-conjunctival osteoma, especially to that of Saemisch, which is, in fact, almost identical with it.

We must take into account that the reports of known cases are relatively brief, and that it is not shown that any inquiry was made as to possible previous traumatism. Moreover, these four cases all relate to young patients, and youth is not the time of life favorable to the growth of neoplasms. I would also call attention to the fact that in the three first cases, as well as in my own, the bony tumor was situated in the upper conjunctiva; this gives additional weight to the theory of traumatic origin, for when there is a violent fall upon or a contusion of the face the upper orbital border is the one to receive the blow, the lower border escaping direct traumatism by reason of the protection afforded by the projection of the malar bone.

I even question whether the subject of sub-conjunctival osteoma is a legitimate one, and whether the cases quoted would not better be included under the head of fractures of the orbital vault, with an encysted movable fragment of bone; this classification would slightly alter the prognosis, although it is true that these tumors are, up to the present time, classed with benign tumors of the conjunctiva.

SUTURE OF THE CORNEA FOR EVERSION OF THE CORNEAL FLAP AFTER OPERATION FOR CATARACT

By Dr. **A. TROUSSEAU.**

At the meeting of the Ophthalmological Society of Paris, held April 3, 1894, I reported a case which demonstrated the great utility of a sclero-corneal suture in the reduction of a hernia of the vitreous body which occurred after simple extraction of the crystalline lens in cataract. Thanks to this suture, I was able to save an eye which I had looked upon as lost.

By means of this same process I obtained an excellent result by causing complete coaptation of a corneal flap which had become everted after operation for cataract, a coaptation which was followed by perfect cicatrization, with preservation of the transparency of the cornea and good visual power.

A woman of sixty-eight years had been operated upon for cataract without the occurrence of any noteworthy incident; the wound was in good coaptation, the iris was in place, the pupil was round, and all seemed to point to a normal recovery, when, on the third day, upon removal of the first dressing, I perceived that the upper corneal flap was completely everted, leaving the iris and a portion of the still round pupil uncovered. Singularly enough, the iris was not displaced, and the vitreous body did not seem to have escaped. Repair of the injury was therefore possible if only the everted flap could be replaced. I attempted several times to replace the flap by means of a spatula, and to keep it in place by simple palpebral pressure, but in vain. The flap, which was replaced with some difficulty, always fell back again as soon as the eyelids were closed. In the face of such contumacy I did not hesitate to suture the upper border of the flap to a small portion of the cornea extending along the sclerotic above (the section had not been strictly peripheric). After vigorous antisepsis I took a needle threaded with catgut 00, and passed it from without inward in the upper part of the flap, then from within outward in the strip of cornea. I gently tightened the thread without losing a single drop of the vitreous body, and obtained an excellent coaptation.

Four days after this operation the wound was cicatrized and the anterior chamber perfectly reformed. The cornea was exceedingly transparent except at the point of entrance of the thread, where it was slightly opaque. There was no reaction. In brief, the patient was able to go out twelve days after the second intervention, the thread being still in place, and with a good eye.

Resorption of the thread was complete in about four weeks, and the vision of the patient, with a convex glass, + 10 D., is ⅛. It would be better yet were there not some pupillary exudation and a small secondary mass adhering to the border of the iris. During the discussion following my communication in March, 1894, at the Ophthalmological Society, Dr. Chevallereau reported a case in which he performed sclero-corneal suture for the eversion of a flap, but in this case vision was not preserved.

I believe that suture of the cornea may be of the greatest use in the treatment of a certain number of complications following extraction of a cataract, as is proved by Galezowski's cases, and by those to which I have called attention.

INSTRUMENTS

SOME INSTRUMENTS

By Dr. **NICATI.**

Fine-toothed Forceps for Iridectomy.—These forceps, which are very light, may remain attached to the iris without causing injurious traction, a quality which will be appreciated by all who are not ambidextrous. It possesses the advantage over Dr. Vacher's forceps of seizing the iris merely by the equal pressure of the handles, which are fixed by a spring. Such pressure is better tolerated than the slightly intermittent pressure of the hand, and the operation is rendered less painful.

Eyelid Speculum without a Catch.—All kinds of catches are troublesome in blepharostats, because their manipulation increases the length of time necessary in the separation of the lids. A good blepharostat is one whose force of expansion is equal to the force of closing of the lids, and has therefore no need of any mechanism for fastening it. The one which I use is the hooked blepharostat of Landolt thus modified.

Palpebral Elevator for Cataract Operation.—This elevator, which is easier of application than the finger of an assistant, and as easily removed by the slightest touch, possesses the further advantage of a more perfect antisepsis. It is composed of one loop of wire soldered in the middle, with its extremities suitably separated and simply bent at a right angle; these extremities, not being curved upon themselves, like the hooks of a blepharostat, are not held by closure of the lids.

Cataract Knife.—This is a triangular and very narrow knife which cuts better than Græfe's knife, and possesses all the advantages of the latter, including that of permitting section of the iris.

Linear Knife.—Very narrow, and useful either as needle or knife, it is not only serviceable in discission and iritomy (see December number of *Annales*), but may also be used for punctures of whatever kind, including opening of the cornea in iridectomy. No anterior chamber is too narrow to admit of its entrance, and there are no possible circumstances in which the lamellar knife should be given the preference.

II.—REPORTS OF SOCIETIES

CONGRESSES

OPHTHALMOLOGICAL SOCIETY OF THE NETHERLANDS

Fifth Semi-annual Session, held at Leyden, May 27, 1894.

Summary of the Proceedings, by Dr. Sulzer.

Dr. Doijer (of Leyden), the annual president, opened the session with a biographical sketch of Bœrrhave. It may be of interest to relate here the chance which led this noted scientist to devote his life to the study of medicine.

Bœrrhave, the son of a Protestant minister, was destined to follow the career of his father. His philosophical dissertation, which he defended in 1690, was a refutation of the philosophy of Epicurus, Spinoza, and Hobbes. It so happened that while making a journey by coach some of his travelling companions were ardent antagonists of the celebrated Amsterdam philosopher. The young theologian ventured to ask one of the assailants of Spinoza if he had read his works. He received no response, but this timid interference in the discussion gave him the reputation of being a follower of Spinoza, a circumstance sufficient at that time to cut short his theological career. Medicine thus gained one of its most celebrated representatives, who was obliged for a number of years to earn his living by giving lessons in mathematics.

A Rare Ophthalmoscopic Image.

DR. WESTHOFF (Amsterdam).—(See *Annales d'Oculistique,* Vol. CXII., p. 351.)

Treatment of Infantile Glaucoma Producing Buphthalmos.

DR. SNELLEN, Jr. (Utrecht).—I have been able to obtain a diminution of the buphthalmos and to arrest the development of this disease in three cases which have come under my observation within a few years by the following operative procedure: every three days I puncture the anterior chamber at the limbus, the punctures being made side by side. The operative treatment is assisted by the energetic use of myotics. This treatment is in accord with the pathological anatomy of buphthalmos, which shows that in this disease the spaces of Fontana are but slightly developed. It causes a distention of Descemet's membrane, which favors reabsorption of the oversecreted aqueous humor.

Descemetitis.

DR. SNELLEN, Jr. (Utrecht).—See *Annales d'Oculistique,* Vol. CXIII., p. 145.)

Operative Treatment of Trachomatous Keratitis.

DR. MULDER (Groningue).—For more than twelve years, in cases of trachomatous keratitis, I have excised the portion of the fibres of the orbicular muscle which are situated on the tarsus. This sphincterectomy is performed with the aim of diminishing the pressure exerted by the upper lid on the cornea from the more or less pronounced tonic contraction of the orbicularis, and at the same time of obviating the ptosis which is always met with in a certain degree in trachoma. Corneal disturbances in trachoma are always limited to the portions of the cornea covered by the upper lid, and raising the latter, as well as diminishing the pressure which it exerts, have an important influence on the development of the corneal affections. In adults, the operation may be performed without the use of cocaine. After applying Snellen's forceps, all the muscular fibres on the tarsus, together with an elliptical flap of mucous membrane, are excised. The wound is closed with several sutures.

This procedure hastens the recovery of existing keratitis, and prevents its occurrence in the majority of cases of trachoma, on which it has a beneficial effect. It prevents the formation of entropion. In cases which require blepharoplasty the two operations may be combined.

This operation may also be recommended in non-trachomatous keratitis accompanied with blepharospasm, and especially in recurring phlyctenular keratitis.

Removal of the Lens in High Degrees of Myopia.

DR. VRIJBURG.—(A general review of recent literature.)

Treatment of Detachment of the Retina.

DR. STRAUB (Amsterdam).—Encouraged by the discussion at our last session, I adopted the operative treatment of detachment of the retina. During the five months since the operation the retina has remained attached. The method employed was the following: An incision through the sclera was made at the point of detachment, and the conjunctiva was then united to cover the scleral incision, and several drops of a solution of sublimate, 1 to 5,000, was injected through the incision in the conjunctiva which laid bare the sclera. This injection was repeated three days after the operation. When the bandage was removed, a week later, the retina was found in place. The patient was sixteen years old, and had a myopia of 16 D. The right eye was blind from an old retinal detachment. The detachment in the left eye was noticed for the first time on May 5, 1893. It was of variable extent, and disappeared completely at two periods, in June and August of the same year.

The operation was performed on January 2, 1894, and as a result the visual field is almost completely re-established.

A Case of Hysterical Amblyopia with Central Scotoma.

Dr. Block (Rotterdam).—Miss J. L——, twenty-five years of age, suffered a marked diminution of vision in the right eye following an operative opening of the right mastoid apophysis made necessary by an operation for a cholesteatoma of the auditory canal, which had penetrated into this cavity. The vision of the left eye was also disturbed.

Five weeks after the operation vision in the right eye was $\frac{5}{8}$, and in the left, $\frac{5}{6}$. The eyes were found to be normal. There was considerable concentric narrowing of the visual field on both sides, and, in addition, in the right eye there was a central scotoma of variable limits. Continuing for some time the perimetric measurements, the exterior limits were found to become more narrow, and the scotoma to increase in extent. The patient had characteristic hysterical stigmata.

Sixth Semi-annual Session, held at Utrecht, December 16, 1894.

The honorary president, Prof. Snellen (Utrecht), introduced the members of the society to the new ophthalmic hospital of Utrecht, an institution perfectly equipped in all respects. The black walls of the operating-room prevent reflections which might trouble the eyes of the patients. A committee on organization was appointed for the International Congress of Ophthalmology in 1899.

Exenteration of the Eyeball.

Dr. Mulder.—I perform exenteration of the eyeball with a sharp curette, after removal of the cornea. This procedure was first suggested to me in 1883 after numerous experiments on rabbits, and the relation of this operation to enucleation was presented in a thesis by my pupil, Daubenton, which appeared in 1884. Since that time there has been a larger experience, and I am able to present the following conclusions :

1. The mobility of the prosthesis is greater after exenteration than after enucleation.
2. Exenteration is easier to perform than enucleation.
3. In panophthalmitis exenteration is less dangerous than enucleation.

This last point has been much discussed. The partisans of enucleation in panophthalmitis take the theoretical stand that meningitis depends on a phlegmon of the orbital tissue independent of any operation and justifies early enucleation of the eyeball. My personal experiences, as well as an examination of the literature, shows the slight foundation for this theory. There is no case of meningitis consecutive to panophthalmitis occurring after exenteration of the eyeball known to us at present.

The method of operating is not without influence on the results of exenteration. Græfe and Bunge detach the conjunctiva from the eyeball and remove a ring of the sclera. They thus sacrifice a portion of the conjunctiva and unnecessarily open the capsule of Tenon. It is preferable to remove the cornea by making a flap section and excising the other portion of the limbus with scissors.

4. The danger of sympathetic ophthalmia is no greater after exenteration than after enucleation if a glass globe is not introduced into the emptied sclera.

5. Exenteration should be replaced by enucleation when sympathetic ophthalmia already exists.

Exenteration is indicated in the following cases:

(*a*) In panophthalmitis.

(*b*) In aged persons with arterial atheroma, or in absolute hemorrhagic glaucoma, or when enucleation may be followed by uncontrollable hemorrhage.

(*c*) In serious injuries, or when loss of a portion of the contents of the eyeball render enucleation difficult.

(*d*) In all cases where cosmetic effect plays the first rôle.

The Form of the Anterior Surface of the Lens.

DR. NICOLAI.—Not being satisfied with the measurements of the anterior surface of the lens made by optical methods, the speaker made plaster casts of this surface in the cadaver after removal of the cornea. He attributes to it a spherical form.

Acute Glaucoma Recovering without Operation.

DR. FABER.—The patient was sixty-one years old. Recovery was obtained by the use of pilocarpine, and there has been no recurrence for six months. In a case of hysterical amblyopia the author has been able to confirm the observations of Grœnouw (see *Annales d'Oculistique,* Vol. CXIII., p. 56) on the influence of accommodation in concentric narrowing of the visual field.

Treatment of Keratitis with Hopopyon.

DR. SNELLEN, JR.—I do not propose to speak of mild cases of this disease, but of those which, in spite of the ordinary treatment, are followed by rapid and more or less extensive destruction of the cornea. In these cases the method of Saemisch has been replaced in the ophthalmic hospital of Utrecht by a free paracentesis of the anterior chamber made in the non-suppurating portions of the cornea. A prompt diminution of the ocular tension is thus obtained without leaving the anterior chamber open for a prolonged period, as is the case in Saemisch's operation. If the hypopyon is reformed, issue may be given to the pus by reopening the paracentesis wound with a probe. Experience shows the superiority of this method.

The Influence of Cocaine on the Healing of Corneal Wounds.

DR. BLOCK.—Clinical experience has never shown me any harmful influence produced by instillations of cocaine on the healing of corneal wounds, as has been described by Dr. Mellinger. To elucidate this question, I have made identical corneal incisions in both eyes of a rabbit after cocoainizing one eye. Microscopical examination of sections of the enucleated eyes made vertical to the corneal incision showed that the reparative process was identical in both eyes at all stages of the healing.

A Case of Sub-conjunctival Cysticercus.

DR. JUDA (Amsterdam).—A cyst, 12 millimetres by 9 millimetres, developed in a boy six years of age, situated at the lower border of the internal rectus muscle and occupying the space between the lachrymal caruncle and the cornea. Its appearance was that of a serous cyst. The characteristic signs of the cysticercus of pork were not discovered until after extirpation of the little cyst. This error in diagnosis is the more excusable as this was the first case of sub-conjunctival cysticercus which has been observed in the Netherlands.

A Case of Epithelioma of the Cornea.

DR. SNELLEN, JR.—The case of epithelioma of the cornea was complicated with a corneal ulceration at the side of the little tumor. In spite of the long existence of the neoplasm, which had been apparent for six months, the epithelial proliferation had not invaded the tissues of the eyeball. The changes found in the ciliary body, the iris, the choroid, and the retina were of inflammatory nature.

A Case of Partial Embolism of the Central Artery.

DR. BOUVIN (The Hague).—The case of partial embolism observed by Dr. Bouvin was peculiar on account of the youth of the patient and the result obtained by the use of massage. The patient was a girl fourteen years old, who had noticed an obscuring of the vision of the right eye two hours before her arrival at the clinic. With the ophthalmoscope, the classic picture of arterial embolism was seen. In two branches of the central artery, directed below and outward, the blood current was interrupted. Massage, practised immediately, caused the vision to increase from $\frac{2}{60}$ to $\frac{4}{24}$. On the next day, after a second massage, the interrupted blood current was re-established; the arterial branch directed outward remained, however, retracted. Four days later vision was $\frac{5}{6}$, and a slight narrowing of the visual field is the only persistent symptom of the embolism.

Pseudoscopy.

PROF. H. SNELLEN.—The speaker presented some hollow reliefs, which appeared convex when observed at a proper distance and with suitable illumination. He also showed some figures which in turn produced the opposite effect from the reliefs.

A Case of Simple Paralysis of the Sixth Nerve Consecutive to Pneumonia.

DR. WESTHOFF.—This paralysis of the right abducens occurred in a child two and a half years old three days after the appearance of acute pneumonia, located in the left apex. It reached its maximum at the same time as the pulmonary infiltration, and improved in proportion to the diminution of the latter condition.

SOCIETY OF GERMAN NATURALISTS AND PHYSICIANS

Session of 1894.

Keratoplasty.

DR. FUCHS (Vienna).—I can count to-day a total of thirty of these operations. The method consists in transplanting a corneal flap in its entire thickness, and it is applicable to corneal leucomas following interstitial keratitis and to ectatic cicatrices of the cornea. In eleven cases the keratoplasty was performed with the cornea of human eyes which had been enucleated. In the majority of cases the transplanted flaps became disturbed after a union which seemed at first favorable. In three cases, however, a slight amount of vision was obtained.

In ectatic and thin cicatrices the results were good in the sense that the transplanted flap produced a flat and solid cicatrix.

Dr. Wicherkiewicz (Posen) had performed a series of these operations, but with no permanently good result.

Dr. Fuchs.—The flap unites quite well, especially if it is taken from the human cornea. I have frequently seen the edge of the flap become fistulous.

Treatment of Inflammatory Affections of the Eyes by Electricity.

DR. VON REUSS (Vienna).—In all irritating affections of the cornea and of the scelera (keratitis, scleritis, episcleritis) the author recommends the following treatment: To apply a small platinum electrode (sclera button) directly to the diseased portion, the other electrode being placed on the cheek; to pass for a minute a current of 1 to 1¼ milliampères. This treatment is not at all painful, and there is no irritative reaction (1).

Dr. Goldzieher (Budapest) uses successfully in scleritis an ointment of iodide of soda (0.25 and 10) combined with instillations of atropine or pilocarpine. Good results have been obtained in acute nodulated scleritis with warm baths and sudation.

SOCIETIES

OPHTHALMOLOGICAL SOCIETY OF PARIS

Session of March 5, 1895.

On the Consequences Which May Result from Infiltration into the Cellular Tissue of Liquids Injected into the Lachrymal Canal.

Discussion of the article by Dr. Leplat. (See *Annales d'Oculistique,* November, 1894, p. 328.)

DR. VALUDE.—Here is a case in which there was no injection into the lachrymal ducts, but which is sufficiently like the case published by Dr. Leplat to merit description in this discussion:

A man about sixty years old, who was troubled with lachrymation, had the canal incised and probed at the clinic of one of my colleagues. It seems that the first catheterization had been accompanied with tearing of the natural passage, and perhaps with a false passage, for the pain was very violent and accompanied with a sensation of tearing. Further, on the two following days a marked swelling of the region and of the cheek was found, with a large ecchymosis.

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(1) Compare the treatment of irido-choroiditis and iriditis with continual currents (*Annales d'Oculistique*, September, 1894, p. 192) which was recommended by Pansier and myself.—VALUDE.

Nevertheless, a second, and afterwards a third, probing could be performed without much pain and without irrigation, at intervals of two days.

Seven days after the first probing I saw the patient, who complained of amblyopia on the side of the operation; two days later he could no longer count fingers at any distance, and perception of light hardly existed. The pupil did not react to light. With the ophthalmoscope, nothing remarkable was found; perhaps the papilla was a little redder than on the other side.

Two days after the first examination a new phenomenon attracted my attention; the eye projected slightly forward, as in exophthalmus, and the lids were somewhat swollen. Movements of the eyeball were, however, free and not painful. The eye and the orbit were the seat of indefinite pains which were not very severe.

The patient went to the country, and I did not see him again till ten days later. At this time the papilla was of a pronounced dark red color; the veins were tortuous and the arteries thinned. V=0.

Little by little the phenomena of atrophy became pronounced and vision remained completely abolished. Several months later the papilla became absolutely white and atrophic, and the exophthalmus disappeared.

The eye in question was formerly emmetropic and normal. It was the right eye, and the patient, a hunter, knew its quality.

What had happened in this case? Considering the absence of pain on moving the eyeball, I cannot assume the hypothesis of tenonitis causing the exophthalmus, but it is difficult not to admit that the forced catheterization had caused a circumscribed orbital cellulitis which had led to atrophy of the nerve by propagation of the neighboring inflammatory phenomena.

The primary source of the orbital infection, later communicated to the nerve, should, I think, be sought for in a tearing of the nasal canal at the time of the first catheterization, and perhaps in a false passage.

I think that tearing of the mucous membrane and false passages are relatively frequent when complete catheterization is practised with initial incision of the lachrymal opening and canaliculus.

From this case it may be seen that such accidents cannot occur without danger of serious consequences.

I am in the habit, therefore, of dividing the operation for simple stenosis of the lachrymal canals into two portions. At the first sitting I split the lachrymal opening and the canaliculus to a greater or less extent, according to the case; two days afterwards I attempt to introduce the sound. I thus guard against such accidents as that related.

Dr. Despagnet.—We owe special congratulations to our colleague, Dr. Leplat, for the scientific courage which he has displayed in relating a very unfortunate case; we should especially thank him for calling attention by this observation to an unfortunate case of too frequent occurrence, which, I have no doubt, may terminate in such a disastrous way. There is no doubt, in my opinion, that the probing tore the mucous membrane, and that it was by the breach thus made that the injected liquid, and with it the infectious germs, passed into the cellular tissue. Dr. Leplat, however, makes some reservations in this respect, for he says there was no resistance found in passing the sound in the upper two-thirds of the canal, and it was arrested at the first obstacle. But in all cases of complete obstruction of the lachrymal openings it is very rare to be able to pass sounds without tearing the mucous membrane, and that without feeling an obstacle to the movement of introduction, and we have as the most common proof of this the flow of blood from the nose when the sound is withdrawn.

It is true that Dr. Leplat did not have this proof, as his sound did not reach the lower extremity of the canal. It is precisely this almost constant tearing which caused me some time ago to modify my method in the fortunately rare occasions when I still resort to the use of the probe. For I was struck with the frequent infiltrations of the injected liquid immediately after withdrawal of the sound—infiltrations which, if they are exceptionally serious, as in Dr. Leplat's case, are always extremely painful. I always guard against following the passage of a sound with injection. I never perform the latter until two days after the probing, and always by employing the most gentle pressure. In this way, if the mucous membrane has been torn, the edges of the wound are already united and form a sufficient barrier to injections under moderate pressure. Dr. Leplat's accident confirms me still more in my method.

One thing which attracted my attention in Dr. Leplat's case was that after the injection there was no palbebral œdema produced by the infiltration, as is ordinarily seen in such cases.

The infiltration was then carried entirely backward. As for its mode of propagation, I suspect a lymphatic rather than a venous channel.

In my opinion the acute phenomena of the first two days were produced by the developing phlegmon of the sac. The transmission to the meninges in the three following days was gradually produced by the lymphatics, and the serious meningeal consequences were produced during the last two days. I lay no stress on the inaction during the seven days following the probing until the death of the patient. It is evident that the sac should have been opened after the second day, but Dr. Leplat was not called until the patient was in a state of coma.

I notice that Dr. Leplat thought he could not curette the sac, as he could not give the patient chloroform. I am greatly in favor of curetting, which I perform very frequently, and never anæsthetize my patients, as the operation rapidly performed is not painful.

Dr. Vignes had never seen sub-cutaneous œdema occur after injection performed immediately after probing.

Dr. de Wecker.—In Dr. Leplat's case the injection forced in, not only the antiseptic liquid, but also the septic contents of the sac. But the most powerful antiseptic fluid cannot kill the germs of pus ; therefore, injection should never be made after incision of the sac.

Dr. Sauvineau.—The aim of catheterization is, among other things, to allow the injection to pass through. I am in the habit of preceding catheterization by the injection of a 1% phenic solution and following this by another. I have never had any accidents.

A Case of Sympathetic Keratitis.

DR. JOCQS.—A woman had lost one eye, which was reduced to a stump. The trouble dated from infancy, and was not due to traumatism. Recently the stump became painful, and simultaneously signs of keratitis developed in the other eye, characterized by an opacity especially pronounced in the upper portion of the cornea. I at first performed total peritomy, and the next day, attributing the disturbance to sympathetic origin, I removed the painful stump ; it was ossified.

The symptoms of keratitis improved very rapidly, and vision returned.

I believe that the keratitis in this case was caused by a sympathetic irritation of the ciliary nerves, induced by mechanical irritation of the ciliary nerves of the deformed eye.

Dr. de Wecker.—The case reported by Dr. Jocqs is not precise enough to demonstrate the existence of sympathetic keratitis, and the improvement found after enucleation of the atrophied eye might also have been produced by the peritomy performed simultaneously.

Dr. Galezowski had seen several cases of sympathetic irritation, and, in his opinion, sympathetic irritation(?) was sufficient to explain the lesions on the opposite side. It is useless to consider the intervention of micro-organisms. This was also the opinion of Prof. Bouchard.

Dr. Abadie admits two varieties of sympathetic ophthalmia, one of ciliary origin, appearing in the form of cyclitis or iritis, and the other of infectious nature, starting insidiously by lesions of the fundus of the eye, and notably of the optic nerve. Dr. Jocqs' case was evidently a case of sympathetic ophthalmia of ciliary origin, and the peritomy probably had some influence on the recovery.

Dr. Despagnet has a patient under his care at the present time who has had two attacks of sympathetic ophthalmia, the first taking the form of irido-cyclitis, and the second, occurring several months after, being characterized by optic neuritis. In which category would Dr. Abadie class this case? There must be a mixed form. Keratitis secondary to cyclitis, as well as descemetitis, quite frequently accompanies sympathetic changes.

Dr. de Spéville has seen in some patients having serious affections of one eye slight disturbances of the other eye without inflammatory symptoms. These disturbances have disappeared after enucleation. He thinks this a reflex sympathetic ophthalmia.

Dr. Terson.—Dr. Jocqs has given an important role to the sensory nerves, but he has not told us if he examined the sensibility of the cornea.

Dr. Jocqs.—I do not think that the peritomy explains the improvement. A methodical examination of the corneal sensibility was not made, but this membrane appeared to have its normal sensibility. The keratitis was uncomplicated, for, after clearing the cornea, no lesion revealing participation of the iris in the inflammatory process could be found.

Does Traumatic Amblyopia or Amaurosis from Reflex Action Exist?

DR. L. DE WECKER.—The title of my article, thus presented in the interrogative form, was suggested by the case which Dr. Trousseau described at our last session. It will first be necessary for me to recapitulate this case, emphasizing the various points which appeared to me most worthy of discussion.

A girl, fourteen years old, after being struck by her music teacher quite violently in the left eye with a sheet of music, stated that a foreign body (a piece of paper) had entered the eye, and declared that she progressively lost the sight of this eye, which remained red, sensitive, and lachrymating for fifteen days. Afterwards these symptoms of irritation disappeared, but vision continued to change, so that, according to the girl's statement, three months after the accident it was completely lost on the injured side.

Three physicians were successively consulted, but the absolute blindness remained, and, as a last resort, a consultation *extra muros* was advised. The girl, however, continued to affirm that a piece of paper had entered the eye. At length, the mother brought her to our colleague, and begged him to make a careful re-examination of her child's eye. This was in the month of July—that is, six months after the injury had been received—and it was not until this time that any one had thought of carefully exploring the eye by everting the eyelid, and then a piece of paper was discovered, much macerated, and covered with mucus.

I know my excellent colleague too well to suppose for an instant that, while regretting this tardy exploration, he did not then make a very thorough examination by passing along the cul-de-sac a spatula or a Daviel currette, in order to sweep the entire extent of the insensitive conjunctival sac. If, after such a procedure, a second piece of paper was found on the next day near the inner angle of the eye, it could not be doubted that this second foreign body had been introduced into the eye by the girl herself, as the first one probably had been.

After the extraction of the second fragment of paper vision returned completely in the space of fifteen days. My colleague, it is true, does not make a categorical statement in his article on the nature of the affection, but there is no doubt that he entertained the ideas of his young patient, as the title of his article shows: "A Case of Traumatic Amblyopia."

Light could have been easily thrown upon this etiological point. It would have been sufficient to preserve the *corpus delicti* and to compare the piece of paper extracted from the conjunctival cul-de-sac with the peculiar paper used in the manufacture of sheet music, a paper remarkable for its thickness and its resistance: further, it must be granted that the paper was very much decayed, for a piece of it thus to be broken off and enter between the lids.

I think that what led my colleague to trust the statement of his young patient, so apt in trickery, was the mydriasis which had been observed at a time when strict surveillance rendered its artificial production absolutely impossible. Here is his statement: "I noticed coniderable mydriasis and anæsthesia of the upper lid. The mydriasis id not prevent the pupil from reacting to light, though very slightly."

When my colleague read his case at our last session I suggested hat in the absence of vision the term amaurosis should be substituted or amblyopia in the title of his article. I will add that the term mydriasis should not be used when the motility of the iris is preerved. The patient simply had what would have been very difficult o produce artificially, an inequality of the pupils, a symptom so common in anisometropia, neurasthenia, hysteria, etc., but to which no great importance should be attached.

If I have possibly laid too much stress on the vulnerable points of his case, it is because it is peculiarly open to attack, which, in my opinion, should be directed against the pretended traumatic reflex; but I do not for an instant wish it to be thought that I wish to ingle out my excellent colleague, as all observations of this kind deserve criticism, my own included.

Allow me to say in this connection that there are thousands of cases reported of prolonged sojourn of a foreign body in the conunctival sac, and that there are barely a few in which reflex reaction has been observed on the functions of the retina or optic nerve.

Cannot thousands of cases of persistent dental neuralgia be estimated, caused by caries and periostitis, and yet how rare are the cases of reaction on the part of the visual organ. Dr. Courtaix has recently published, under the title "Clinical Researches of the Pathoogical Relationship between the Eye and the Teeth," a series of cases which he has carefully collected from literature, and yet how few in number they are. A hundred cases.

Observe what has become of the so formidable amblyopias and amauroses following injuries of the region supplied by the supraorbital nerve since the immortal discovery of Helmholtz, which permits us to find that in traumatisms of the supra-orbital region there are direct disturbances of the optic nerve, most frequently occasioned by fissures of the optic canal. It is the same when an infectious focus in the gums, following dental caries, is complicated, exceptionally, by disturbance of the optic nerve; an anatomical anomaly may here intervene to explain the propagation of the infection without the necessity of invoking reflex action.

In conclusion, allow me to make a last reflection. If a perfect exactitude in the wording of observations should be the rule in our specialty, and that especially in virtue of a language so concise as the French a rigorous precision is more than ever imposed, to interpret certain facts, venturing on a ground so unreliable as reflex action, particularly when this action should be exerted from a nerve of general sensation to a nerve of special sense like the optic nerve.

Dr. Abadie.—I have seen children with amblyopia or amaurosis who could clearly be accused of simulation, but there also are cases where hysterical amblyopia cannot be doubted. In these cases, the use of a magnet may be an excellent method of diagnosis. I know of no cases outside of the authentic ones reported of blindness from reflex action.

Dr. Parinaud.—In a communication *On Reflex Hystero-traumatic Amaurosis and Amblyopia* (Ophthalmological Society of Paris, 1889) I said that probably these amblyopias did not exist. I described cases of amblyopia, or amaurosis of hysterical nature, caused by peri-ocular traumatisms, and also a case of amblyopia combined with the presence of tænia, which was likewise of hysterical nature. Apparently, all the cases of amblyopia or amaurosis attributed formerly to reflex action are related, on the one hand, to compression or tearing of the nerve in cases of fracture of the base only revealed in some cases by this one symptom, and on the other hand to traumatic hysteria. But many oculists do not care to recognize traumatic hysteria. Without taking the pains to make a thorough examination, they prefer to call it simulation.

Among the traumatic hysterical amblyopias there is one variety which it is particularly useful to know, because it may be confused with sympathetic disturbances. In three patients who had one eye enucleated on account of injuries, and who complained of disturbances in the remaining eye, I found amblyopia, supposed in one case to be sympathetic ophthalmia, which was clearly hysterical. Two of these patients had been operated upon by me, not for sympathetic disturbances, but because the eyes which were injured and lost remained painful. I cannot say whether the hysterical trouble preceded or followed the enucleation. Dr. Morax told me that he had seen a similar case at the Bichat hospital.

I also remember seeing in Charcot's service a patient who had an eye enucleated for pretended sympathetic disturbance. The visual troubles, far from disappearing, were more aggravated. I found that they were due to hysterical amblyopia. The patient has recently had severe attacks.

Dr. Parent.—Does Dr. de Wecker also deny the reflex origin of amblyopia occurring in the course of affections of the female organs which he described in his treatise?

Dr. de Wecker.—I have altered my opinion on the nature of this form of amblyopia and think that perhaps it is of infectious origin. Dr. Abadie says that some children simulate, and that the cause cannot be found; I think that the cause is simply a desire to come to Paris.

Etiology of Ulcerations of the Cornea in the Course of Cholera.

DR. GORECKI read a review of an article on this subject by Dr. Garlinski (Warsaw). I have two theories to explain the corneal lesions in the course of cholera: the theory of desiccation, and the neuro-paralytic theory of von Græfe. Garlinski gives a third, also quite theoretical, and which supposes lesions of poisoning.

False Lenticonus.

DR. JAVAL.—Review of an article by Dr. Demicheri (see *Annales d'Oculistique*, February, 1895). In connection with the facts published by Demicheri, Javal relates a case which he has followed for many years, and which was characterized by the appearance of a high degree of myopia at the age of fifty-five, in a person formerly emmetropic.

Dr. de Wecker.—These facts are of great practical importance, and it was Critchett who first called attention to the appearance of myopia in aged persons who ultimately had cataract. It should be known that this myopia may reach a high degree.

MEDICAL SOCIETY OF BUDAPEST

Session of January 26.

Absolute Blindness Caused by a Vermifuge.

DR. GROSZ.—A man twenty-nine years old had somewhat weak vision in the left eye, but perfect vision in the right. He was suffering from his stomach, and went to a pharmacist, who gave him a vermifuge, consisting of capsules of etherial extract of male fern and extract of pomegranate; each capsule contained about 0.25 gramme of this combined medication. He took 32 of these capsules—that is, about 8 grammes of the medication—after previously taking castor oil.

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In the evening he had syncope. The next day he had severe diarrhœa, and two days later he was blind in both eyes.

On examination there was complete mydriasis, and the pupils did not react at all to light. At first the fundus of each eye was normal, but little by little both lost their color and became atrophic.

The author thinks that the noxious influence here was the extract of fern, which is toxic in doses of 4 to 5 grammes ; perhaps, also, the castor oil previously taken reinforced the toxic action.

MEDICAL SOCIETY OF BERLIN

Session of February 20.

Ocular Tuberculosis.

DR. SILEX reported the case of a child six years old who presented the most typical form of tuberculosis of the iris. Experimental inoculation in rabbits was conclusive. In spite of the clearness of the case the author did not dare to employ injections of tuberculine then in vogue, because it had not given satisfactory results. He was content with external washes of boracic acid solution—that is, the treatment was *nil*. Afterwards the child went to the country. When he returned Dr. Silex was surprised to find that the tubercular nodules had disappeared completely.

What result would have been obtained in this case with the use of creosote, iodoform, and especially injections of tuberculine!

It is, then, well to know that ocular tuberculosis may recover spontaneously.

ANATOMICAL AND PHYSIOLOGICAL SOCIETY OF BORDEAUX

Session of February 11.

Sub-conjunctival Cyst of Dermoid Origin.

DRS. PUECH and FROMAGET.—A woman, forty-one years old, had at the lower orbital border quite an apparent swelling, which diminished gradually toward the commissures and gave the idea of a tumor in the lid. The border of the lower lid was well applied to the ocular conjunctiva.

In endeavoring to find the consistency and situation of the tumor it was felt to escape from under the fingers, and on forcibly drawing down the lower lid a cyst the size of a pigeon egg immediately shot forward.

The envelope of the cyst appeared to be quite thin. Its bluish-white color allowed a transparent serous liquid to be seen, somewhat suspicious-looking, and having in its lower portion a creamy-white mass.

As the patient refused to have it completely extirpated, I drew off the fluid and partially resected the wall of the cyst.

The fluid, on withdrawal, soon coagulated like the fluid from pleurisy, and I found in it some scattered epithelial cells, red corpuscles, and quite a large number of pus corpuscles.

The wall was composed of very lax conjunctival tissue which did not differ from ordinary sub-conjunctival tissue, and was covered within with several layers of polygonal epithelial cells, more or less flàttened, whose nucleus, protoplasm, and envelope were very distinct. This was, then, a variety of *congenital dermoid cyst,* which arose from inclusion of a portion of the conjunctiva, and which had remained a long time unnoticed.

ROYAL ACADEMY OF MEDICINE OF IRELAND

Session of January 4, 1895.

Mr. Strong had operated on 100 cases of cataract. In 8 cases vision was less than $\frac{1}{10}$, and in three cases, although the operation was successful, there was only perception of light on account of a former affection. In 42 cases the operation was performed without iridecomy, in 46 with iridectomy, and 12 extractions were performed after preparatory iridectomy.

The principal factor in the success was antisepsis, and the author is unable to say whether he prefers the simple or combined extraction. He makes a flap of three millimetres, as recommended by Dr. de Wecker.

Mr. Swanzy in 270 operations had only had 2 cases of panophthalmitis. He everts the lids and irrigates the eyes with a $\frac{1}{10000}$ solution of sublimate. The instruments are plunged in boiling water and then in a weak carbolic solution.

Mr. Story bathes the eyes with a boiled solution of boracic acid. He everts the lids and irrigates the eyes with a bichloride solution, 1 to 10,000.

The instruments are immersed in boiling water, and then in a weak carbolized solution.

Mr. Story washes the eyes with a solution of boric acid which has been boiled.

MEDICAL SOCIETY OF PLYMOUTH

Meeting of the 29th December, 1894.

Glaucoma.

DR. ELLIOT SQUARE has seen numerous cases of glaucoma which physicians have failed to recognize and have mistaken for cataract. This error should not be committed.

After doing homage to von Græfe and Helmholtz, the author describes the various forms of this affection, which are the acute, chronic, and secondary.

Eserine, either alone or in combination with cocaine, is all that is necessary to relieve the first symptoms and keep the case along until iridectomy shall be performed. In case of blindness following infantile glaucoma, the eye must be enucleated.

III.—REVIEWS OF OPHTHALMOLOGICAL JOURNALS

Albrecht von Graefe's Archiv für Ophthalmologie

Reviewed by Dr. V. MORAX.

Vol. XL., No. 5.

I.—Upon the Color Reactions of the Retina Exposed or Not Exposed to the Light, by Prof. BIRNBACHER.

The experiments of Angelucci, Van Genderen Stort, Engelmann, Gradenigo, and Dennisenko have demonstrated that the component parts of the external layer of the retina exhibit notable differences, according to whether this membrane was or was not exposed to the light immediately before fixation. Angelucci and Chodin, moreover, noted that light produced chemical changes in the retina. The retinæ of frogs which have been kept for some time in the dark always give an alkaline reaction, while those which have been exposed to the light give an acid reaction, the degree of acidity depending upon the time of exposure. In the study of these phenomena Birnbacher used the histo-chemical reagents so ingeniously applied by Ehrlich to the study of leucocytes. For the purpose of experiment, salamanders, frogs, and fish were used, among the latter the perch (*perca fluviatilis*), in which the cells of pigmented epithelium and the cones are especially well developed. After being either exposed to the light or kept in the dark the eyeballs were enucleated and immersed in the fixative reagent (nitric acid, 3.5%, or acid bichloride).

The fixation, hardening in alcohol, and inclusion were always performed simultaneously, whether the eyeballs had or had not been exposed to the light. For the staining, the various aniline colors were used, but the "Biondi-Heidenhein" mixture (eosine and methyl green) is the one which has given the best results. The differences in coloration between retinæ exposed to the light and those which have been kept in the dark are constant.

In the specimens of retinæ exposed to light and stained with acid reagents (eosine), the coloring is light and diffused. In those not exposed to light, the ellipsoid of the cone is stained a deep rose color (eosine) or blue (acid violet), the other portions of the retina remaining colorless.

With the Biondi-Heidenhein mixture, the cones are green in retinæ exposed to the light, and yellow in those which have been kept in the dark. Evidently, then, under the influence of light, some of the retinal elements undergo a change in their chemical properties; this does not imply that the action of light is confined to the cones, or that it occurs within the interior of the ellipsoid of the cone. From these experiments we see that the same element may be acidophile or not, according to whether it be in a state of functional activity or rest.

II.—**Researches into the Physiology of the Diameter of the Pupil,** by Dr. O. SCHIRMER.

If we exclude the influence of convergence, of accommodation, and of psychical or sensory stimulation upon the diameter of the pupil, we see that this diameter in any particular eye depends, not alone upon absolute light, but also upon the influence of another factor, the retinal adaptation. In passing from darkness or from light into a medium light the result is not the same. In the former case, the pupil will be very narrow; in the latter, it will be large. Schirmer has endeavored to ascertain the influence of retinal adaptation upon the diameter of the pupil. With this view, he had a pupillometer constructed, the most ingenious part of which consists in the use of a prism which allows of the examination of the pupil from one side without throwing any shadow upon the eye. The result of his observations is as follows: Just as the modifications of light (the adaptation remaining the same) cause changes in the diameter of the pupil, so do modifications in the state of adaptation (the external light remaining the same) cause a contraction or a dilatation of the pupil.

When the adaptation of the retina has attained its maximum, the pupillary diameter remains the same (of course, excluding the influence of convergence, accommodation, and psychical and sensory stimulation). This is the pupillary diameter which Schirmer considers to be the physiological diameter. The pupillary diameter, therefore, and pupillary reaction, depend upon the relation between the external light and the condition of adaptation of the retina.

III.—**Ophthalmo-tonometric Studies**, by Dr. F. Ostwalt.

The author made comparative experiments with various tonometers, especially those of Maklakoff and Fick. The former gave very useful comparative results, while the latter gave absolute measurements—that is to say, the figures obtained correspond to the real tension estimated by a column of mercury, but its use necessitates some skill. Ostwalt believes that these tonometers are sufficiently practical to replace exploration by touch, according to Bowmann's old method, in the clinical or scientific study of certain cases. Ophthalmo-tonometry would seem to have entered upon a new phase of its existence, and one (shall we say ?) full of promise.

IV.—**Vision in Myopia**, by Dr. H. Triepel.

No distinction has as yet been made between the visual acuteness (estimating the retinal sensitiveness after correction of ametropia) and the visual powers of a non-corrected eye, or perhaps we should rather say that the same form of expression, "visual acuteness," is used to indicate these two different functions of the eye. We find very little in medical literature about the sight of the ametropic eye (non-corrected) outside the theory of the vision in the circles of diffusion. In his work Triepel has endeavored to fill this gap, especially in what relates to myopia. His experiments were made upon the pupils of a school in Leipzig, upon 388 eyes affected with simple myopia, or myopia complicated by astigmatism, or simple astigmatism. Tests of vision were made by means of Snellen's Types placed at a distance of 6 metres. A comparison of the results obtained in various subjects whose degree of myopia was the same, and at various ages, leads Triepel to the following conclusions :

1. In the myopes from nine to twenty years of age sight (noncorrected) is better the older the patient.
2. The wearing of glasses for distant objects diminishes the power of vision, while glasses for near objects may improve it.
3. Astigmatism makes the sight of a myopic or emmetropic eye worse, but vision is nevertheless better than if all the meridians of the refractive system possessed the refractive power of the most refractive meridian.

V.—**Vision in Circles of Diffusion,** by Dr. SALZMANN.

In a previous note which appeared in Vol. XXXIX. of *Græfe's Archives* the author endeavored to outline the theory of the circles of diffusion, with the object of bringing out some of the symptoms of a high degree of hypermetropia. He easily demonstrated that a hypermetropic eye performs its functions in a manner nowise different from that of a myopic eye, and that consequently the laws of sight in the circles of diffusion are the same for all normal eyes. From an optical point of view, the identity of the circles of diffusion in myopia and hypermetropia were evident, but the demonstration of this identity from a functional standpoint still remained to be done. In this second *Mémoire* Salzmann makes a study of the vision in the circles of diffusion, leaving refraction completely out of the question.

We will not follow the author through his formulæ and his curves, which lead to the conclusion that so-called distinct vision is merely a particular kind of vision within the circles of diffusion, and that they both obey the same laws, the difference between them being not qualitative, but quantitative.

VI.—**Upon the Clinical Forms of Diphtheritic Conjunctivitis,** by Dr. O. SCHIRMER.

It is many years since any case of diphtheritic conjunctivitis has occurred at Greifswald, although there has been a serious epidemic of pharyngitis. On the other hand, Schirmer has observed cases of croupous conjunctivitis complicated by corneal lesions of far greater severity than those usually noticed, a fact which induced him to make bacteriological examinations of these different cases. The presence of the bacilli of diphtheria was proved by cultures, and their virulence by the inoculation of guinea pigs.

The clinical appearance was that of croupous conjunctivitis; the eyelids were not indurated; the false membranes were easily removed. The subjacent mucosa was not ulcerated. Cures occurred without leaving cicatrices. This croupous conjunctivitis was, however, caused by the virulent bacillus of diphtheria. How shall we explain the fact that this bacillus will at one time cause a true diphtheritic conjunctivitis, and at another, a croupous conjunctivitis? Schirmer does not settle this question, but merely calls attention to the fact that in the cases examined by him the number of colonies obtained upon serum was small and the degree of virulence of the bacillus not high. Can we, from a clinical point of view, differentiate between croupous diphtheritic conjunctivitis and croupous non-diphtheritic conjunctivitis?

Without definitively answering this question, Schirmer believes that we should decide in favor of croupous diphtheritic conjunctivitis when, in children from two to seven years of age, extensive pseudomembranes develop upon the whole tarsal cartilage and in the cul-de-sac, especially if the affection is unilateral, if the false membranes are easily removed, if the subjacent conjunctiva is hyperæmic and bleeds readily, if the eyelids are swollen, and, finally, if the affection is very painful. The diagnosis is rendered still more positive if any possibility of contagion can be established, if upon the inflamed conjunctiva small adherent exudations are found, and if upon the cornea there are superficial, diffuse, and extended opacities.

The treatment prescribed in these different cases, which receives Schirmer's approval, consists in applications of ice and in frequent washing with a 1 to 5,000 bichloride solution. He, moreover, advises protection of the unaffected eye by occlusive dressings.

In spite of their clinical differences, he believes it preferable to classify these cases etiologically, under the name of diphtheritic conjunctivitis.

We would call attention to the fact that these same conclusions may be found in a *Mémoire* by Sourdille, which was published six months before the one under discussion. The author does not seem to know of this work.

VII.—**Extraction of a Piece of Glass from the Anterior Chamber, and Reflections upon the Inflammation Caused by the Foreign Body,** by Dr. A. Wagenmann.

Basing his opinion upon experiment, Leber held that glass cannot be considered completely inert from a chemical point of view, and that when introduced into the anterior chamber, not only the mechanical action must be taken into account, but also the chemical, an action which is, however, very slight. Wagenmann had the opportunity of following for a year the case of a patient within whose anterior chamber was a fragment of glass. The foreign body had penetrated through the cornea by a wound which had rapidly cicatrized, and neither the iris nor the crystalline lens had been injured. It had lodged in the inferior irido-corneal angle. A slight turbidity was distinguishable, six months after the accident, at its point of contact with the cornea, while the tissue of the iris involved was a little thickened. The anterior chamber seemed to be a trifle deepened. The pupil was normal, although it appeared to be drawn downward a little; there were no reactive phenomena in the eye, but after each examination there was some ciliary injection. Ten months after the accident this ciliary injection had become a permanent condition, and was increased by examination. Moreover, a parenchymatous, triangular opacity had developed upon the lower half of the cornea. A slight diminution of visual power was the result of this opacity. The iris was slightly thickened at the point of contact with the foreign body. The ciliary injection continuing to increase, the patient consented to an operation. A transverse incision, 6 millimetres long, in the lower part of the cornea, allowed of the removal of the fragment of glass with forceps. The fragment was at once put into a tube of gelatine. The nutrient medium remained sterile. The after-results of the operation were quite simple, and the ciliary injection completely disappeared.

Wagenmann believes that the slow and progressive development of the inflammatory process cannot be attributed to mechanical action alone, more especially as the foreign body was immobilized.

VIII.—**Congenital Bilateral Cataract with Perforation of the Crystalline Capsule in the Rabbit,** by Dr. HERMANN VUELLERS.

The author made a histological examination of the eyes of a rabbit in which, from birth, had been noticed bilateral cataract. There were no corneal lesions nor cicatrices of penetrating wounds. The anterior part of the capsule of the lens of one side showed some solution of continuity, but upon the other side it was intact. The lens had undergone retrogressive changes; its size was less than normal.

How are these lesions to be explained? Vuellers believes that they were due to traumatism occurring during fœtal existence, the traumatism having either occurred upon the mother's abdomen or else a second fœtus having hit the one whose lesions form the subject of this paper.

IX.—Contribution to the Study of Tuberculosis of the Lachrymal Glands, by Dr. F. Salzer.

The first cases of tuberculosis of the lachrymal gland were reported by Lapersonne and Müller. Baas added two new cases. Salzer made a study of one. It was that of a girl of fifteen years, from whom Czerny removed a little mass of tuberculous ganglia from the cervical region, and a small tumor, the size of a pea, situated beneath the upper left eyelid, which had developed three years previously. This tumor was hard, movable beneath the orbital arch, painless, and non-adherent to the skin. Macroscopic examination showed an alveolar structure. Microscopic examination revealed, in the midst of the more or less altered glandular tissue, an infiltration of round cells, and here and there nodular infiltrations with lymphoid cells, and a few occasional giant cells. No tubercle bacilli were shown by the use of coloring agents, and inoculation was not performed. Salzer thinks that the macroscopic appearance of the lesions in this case are sufficient to establish the diagnosis of tuberculosis. This case serves him as a basis in refuting the theory of the interstitial development of tuberculosis, and in upholding that of the active participation of parenchymatous tissue in its formation. As may well be imagined, the refutation is purely speculative, and stands a chance of convincing nobody.

X.—Hepatic Ophthalmia, by Dr. K. L. Baas.

Medical literature contains but few exact data proving a relation between certain hepatic affections and lesions of the eyeball. One of the oldest reports is that of Bischoff and Müller, who noticed the development of amblyopia without lesions of the transparent media in two dogs in which they had previously created biliiary fistulæ. At the autopsy they found an atrophy of the external layers of the retina, with abundant deposit of pigment. The lamina pigmenti was atrophied in places. The hyaloïd was thickened in spots, and in corresponding portions of the vitreous there was an infiltration of leucocytes. Here and there the retina also was infiltrated and œdematous. Müller considers that these lesions were the result of the biliary fistula.

A little later Junge reported the case of a young man suffering from cirrhosis of the liver, in whose retina were found hemorrhages in the layer of nerve fibres, and degenerated cells between the external and internal granular layers. Stricker, Förster, and Litten all had cases of retinal hemorrhage in hepatic affections with icterus. In 1872 Landolt reported two cases of pigmentary retinitis with cirrhosis of the liver, but in his cases both the retinitis and the hepatic affection were of long standing.

As to functional troubles, hemeralopia was noticed by Bamberger and Frerichs, who attributed it to the icterus and to disorders of nutrition. At about the same time Cornillon and Parinaud reported cases of hemeralopia in certain hepatic affections with icterus. In his profound work, Parinaud shows the relation between hemeralopia and changes in the visual purple, and lays stress upon the absence or weakening of visual power, the functions of the macula.

Leber quotes the case of a patient of fifteen years of age, suffering from hypertrophic biliary cirrhosis with icterus, who became hemeralopic, the visual power and field of vision remaining normal. Weiss noted a woman who, in the sixth month of pregnancy, had intense icterus and promptly became amaurotic. Microscopic examination showed an infiltration of leucocytes in the choroid, especially in the external and middle layers. To this list Baas adds two new cases, which we append because of the great interest of the subject.

I.—Young man of twenty years, giving no history except that of osteo-myelitis of the humerus at twelve years of age. In 1892 he noticed an increase in the size of his abdomen without cutaneous icterus, but coincident with mahogany-colored urine. Shortly afterwards he had an attack of hemeralopia, which lasted three months. At the end of 1892 he was attacked by diarrhœa, with high fever and icterus. Dating from that time, his physician has noticed marked hypertrophy of the liver and spleeen. In July, 1893, he again suffered from hemeralopia. By the aid of Förster's photometer, a certain degree of retinal torpor was found. There was also slight xerosis of the conjunctiva. The crystalline lens was the seat of numerous white opaque spots. The fundus of the eye appeared to be slightly opalescent, as though there were a slight granular turbidity. The visual power and field of vision were normal. This attack also coincided with icterus, and hypertrophy of the liver and spleen. In December, 1893, the ocular disturbances again disappeared, while the general phenomena became less. Since that time there has been no hemeralopia.

II.—Youth of sixteen years, without hereditary taint. At seven years of age he was seized with vomiting coinciding with icterus and obliged to remain in bed six weeks. At fourteen years he for the first time noticed marked hemeralopia. The following year, the icterus and vomiting reappeared with cephalalgia; the hemeralopia was still more marked, and this induced him to consult a physician. It was at this period that Baas first saw him, and found decided icterus, hypertrophy of liver and spleen, and slight œdema of the lower limbs. There was no albumen in the urine. Ocular examination showed visual acuteness which was very slightly diminished, visual field and color-perception normal. By means of Förster's photometer, marked retinal torpor was found. Special lesions were found in the fundus of the eye, consisting of tenuity of the pigment and a slight turbidity of the retina up to the edges of the papilla. The arteries seemed to be a trifle pale. At the centre small white points deprived of pigment were seen by the side of foci of pigment. There was, in addition, xerosis of the conjunctiva.

During the fifty-six months that the patient spent in the hospital the hepato-splenic disorders persisted; the icterus was more or less marked, there was no abatement of the hemeralopia. The patient died with symptoms of hepatic asystole. At the autopsy hypertrophy of the spleen was found, and cirrhosis of the liver with icterus and numerous hemorrhages.

A microscopic examination of the eyeball was made by Baas, who found generalized vascular lesions in all the vessels of the eye, especially marked near the choroid, in the form of endarteritis and endophlebitis. Hyperplasia of the vascular wall and diminution in the calibre of the blood vessels produced modifications in the circulation. The changes in the pigmentary epithelium (atrophic changes) must be considered as a consequence of the lesions of the choroid. To these lesions of the circulatory system must also be referred the slight œdema of the papilla and of the retina, as well as the foci of cellular infiltration (white spots). Hemeralopia may be laid to the charge of lesions of the pigmented epithelium, whose role in the production of the visual purple seems to be well established. As this epithelium derives its nourishment from the chorio-capillaries alone, it is easily seen how the secretory conditions are modified by the vascular lesions. Baas attributes these vascular lesions to the icterus; he suggests that to these ocular alterations be given the name of *cirrhosis of the choroid,* and to differentiate the affection by the term *hepatic* or *icteric choroiditis.*

XI.—**Accommodation and Convergence,** by Dr. ALFRED GRÆFE.

In a work upon the "Results of the Operation for Strabismus," Schweigger holds that accommodation and simple binocular vision (the tendency to fusion) are all-sufficient to account for all the phenomena relating to the subject, and he does not believe in the intervention of a third factor, which Hansen Grut has called the "sense of convergence" (Nahebewusstsein), and which the author calls the effort of convergence" (Convergensbestreben). The author draws attention to the fact that when any object is fixed within the punctum proximum in a presbyopic patient, and outside of the punctum remotum in a myopic patient, by placing a small screen before one eye, the two eyeballs take the exact corresponding position, although under these conditions there is neither fusion nor accommodation. Schweigger says, in opposition, that, in presbyopia, if accommodation is no longer manifested by the same optical effect, because of changes in the crystalline lens, the innervation of accommodation persists from the force of habit. He, moreover, states that, in the myopic, divergence is the rule under the conditions indicated above, and that it is exceptional to see the eyeballs take the position corresponding to the distance of the object. However that may be, we must look for the cause of this phenomenon, whether it be exceptional or not, and for its explanation, to admit the third factor—effort of convergence. Physiologists have interested themselves only in fusion and accommodation, and that we can understand because, in the emmetropic, and under normal conditions, these two phenomena are enough to explain the visual phenomena in question. But that does not imply the non-existence of this force, which under normal conditions remains latent, appearing only when the normal conditions are changed. It can, moreover, not be admitted that the necessity for directing the optical axis of one eye upon a point fixed by the other causes the development, from habit and exercise, of a need of direction, separate from accommodation up to a certain point, and constituting a more or less independent mechanism.

IV.—BOOK NOTICES

BOOKS AND THESES

Inflammation of the Sinuses and Its Consequences,

by Dr. HERMANN KUHNT. (267 pp. Wiesbaden: Bergmann, 1895.)

In a monograph, which is as complete as it is profound, Kuhnt expounds the nosography and pathological anatomy of inflammation of the frontal sinuses to its remotest detail. The cases which form the foundation of this truly classic work have been gathered, not only from ophthalmological literature, but from periodicals of general surgery, rhinology, laryngology and general medicine. Kuhnt's book is therefore as interesting and useful to the general practitioner as to the specialist. According to the nature of the secondary disorders following inflammation of the frontal sinus, this affection will fall to the lot of the rhinologist, surgeon-oculist, or general practitioner (meningitis). A complete work upon this subject must, therefore, comprise all medical literature. To this author belongs the credit of having attempted and succeeded in accomplishing a work so extensive.

The cases which are brought to the oculist are usually serious ones with dangerous complications. Simple, chronic cases, with periodical exacerbations, belong chiefly to the rhinologist and the general practitioner. The many cases reported in this work prove the link existing between the light cases of chronic rhinitis propagated to a certain part of the mucose of the sinus, and the severe cases producing extensive necrosis of bone and causing death by meningitis or by cerebral abcess. In regard to the symptomatology, we must content ourselves with a mere mention of its polymorphism ; to attempt anything more would be to go beyond the limits of a review.

Affections of the maxilliary, ethmoidal, and sphenoidal sinuses are described, perhaps a little too briefly. In recent works upon inflammations of the sinuses there is a great deal of "old new." The author has endeavored to give credit to the proper authorities of clinical discoveries as well as of therapeutic measures, a task the difficulty of which can only be realized by recalling the vast extent of the literature upon the subject and the frequent impossibility of tracing things to their sources. One should beware of quotations. The author was led into error by trusting to the authority of the famous G. A. Richter. He says, on page 114 : "It is a mistake to attribute the opening of the anterior wall of the maxillary bone to Desault. G. A. Richter quotes it without reference to Larmorier." Desault's process is different from that of Larmorier. The latter proposed opening the lateral wall of the maxillary sinus above the alveolar border, below the maxillary apophysis, after having separated the commissure of the lips and raised the upper lip. Desault opened the anterior wall at the canine fossa. In actual practice Larmorier's process, so far as we know, has been abandoned for that of Desault, whose name it rightfully bears.

The very unimportant nature of our criticism proves that in Kuhnt's book there is really nothing to criticise. By reading it one obtains new views and new lights upon the old views of inflammations of the sinuses, and will be likely to search for an affection of the sinuses in many cases where the diagnosis had previously remained symptomatic (migraine, neuralgia).—SULZER.

Apparatus for Instruction in Ophthalmoscopy, by Dr. Weiss.

The apparatus designed by Weiss is likely to greatly facilitate instruction. Two large plates of ground glass are mounted in such a way that behind them one can insert various pictures representing the fundus or parts of the fundus of the normal eye. By moistening the ground glass with water or oil, it is rendered transparent, and upon it can be arranged drawings of various affections revealed by the ophthalmoscope.

The drawings used by Weiss for this purpose are well made. They represent a normal fundus and a papilla. By superimposing two or more plates of glass, one can follow the steps in the progress of a disease.

MISCELLANY

CORRESPONDENCE

We have received from our esteemed colleague, Dr. Leplat (of Liège) the following letter :

Liege, February 15, 1895.

My Dear Colleague :

In the January number of *Annales d'Oculistique* Dr. Darier reports a case of chronic irido-choroiditis in which he saw the development of vessels upon the anterior surface of the capsule of the crystalline lens. The case seemed so extraordinary that at first he was in doubt as to the actual position of the vessels being such as it appeared, and that he now feels it necessary to give the reasons which made him reject the idea of a persistent pupillary membrane. He finally reaches the conclusion that this vascular tuft must have originated from a pupillary exudation. I have never seen a similar new formation following idiopathic irido-choroiditis, but twice in the past two years I have seen it in eyes suffering from traumatic irido-choroiditis. As it may prove of interest to your readers, and to Dr. Darier especially, I will give you a brief history of the cases.

Upon the 6th of last December, Leon L——, twelve years of age was watching a workman fasten telephone wires to the top of a pole when a piece of copper wire fell into his right eye, from which he himself removed it. On the 9th of December he came to consult me, and I found the eye greatly injected. There was a wound with infiltrated edges situated upon the cornea, between the centre and the external boundary ; a large hypopyon was in the anterior chamber. I punctured the cornea to evacuate the pus. The aqueous humor which was reproduced was, as usual, filled with fibrin ; this contracted, and finally ended by forming a thin membrane upon the anterior surface of the capsule of the lens. This membrane diminished by degrees, and at last disappeared. When the aqueous humor had become clear again, and the corneal wound was healed, I found that the copper wire had gone through the iris. The eye softened, sight was lost, the iris atrophied, the pupil became yellowish-white in color, and the anterior chamber was obliterated. In spite of sub-conjunctival injections of bichloride, the eye remained strongly injected and painful to pressure.

After resorption of the fibrinous exudate from the pupil, I noticed the development of fine vascular ramifications upon the anterior surface of the capsule, starting from the external borders of the pupil. This vascular plexus was composed of four larger vessels united by slender anastomoses, the whole ending in loops. Upon the iris, which was atrophied in such a way that in spots it was translucent, several dilated vessels were observed, but it was not possible to prove any connection between the vessels of the iris and those of the capsule.

The second case was that of a young man, Mathieu D——, who came to see me the 9th of June, 1893, four weeks after having been wounded in the right eye by an iron fragment, which did not, however, remain there.

I found the right eye considerably injected, cornea normal, with the exception of a cicatrix 1 millimetre long, which was lost in the interior lower portion of the corneal margin, and exhibited a little iris pigmentation at its two extremities. Anterior chamber obliterated. Iris discolored, in course of atrophy, grooved here and there by vessels : it had been torn from below inward, in such a way that the pupil was continued into a coloboma, which went up to the corneal cicatrix. The pupil, which was drawn toward the enclosure, had fairly preserved its rounded form ; the angles of the coloboma were visible. The crystalline lens, already grooved by opaque striæ, showed the vitreous body, which had become of an opaque yellowish-white color. T—2, V=0. Upon the capsule of the lens were two slender vascular ramifications, one above and one below, connecting with the iris wherever the sphincter persisted (in the pupillary field, and not in the coloboma).

The patient had left the physician who had charge of the case because he was opposed to enucleation of his eyeball. I tried subconjunctival injections of a bichloride solution. The first was made on the 26th of June. The next day I found that above and interiorly the iris was separated from the cornea by a little aqueous humor. This result of the injection so surprised me that I thought I must have made some mistake in my previous observation. The 3d of July a second injection was made, after which a further increase of aqueous humor was noticed. The 23d of July, a third injection: the anterior chamber was quite re-established; the eye became pale.

So far as I know, no cases have as yet been reported of reconstruction of the anterior chamber of the sub-conjunctival injections. It must be admitted that this one had been obliterated from an insufficiency of a secretion of aqueous humor. How can we explain the stimulation of this secretion by the bichloride?

The first case above described did not give me such good results from the injections, which were not efficacious, and yet there was a great analogy between the conditions of the two eyes.

Here, then, were two cases of traumatic irido-choroiditis in which vessels were developed upon the anterior surface of the capsule of the lens. In the first, I noticed the progressive formation of the vessels, and I can state that they appeared only after resorption of the fibrinous exudate. (I have several successive sketches of this eye.) In the second case, the vessels were already formed, but their appearance and eccentric position did not allow me to consider them as remains of a pupillary membrane. It must, of course, be granted that a sub-stratum is necessary to the development of these vessels, but I found no traces of any exudate deposited upon the capsule at that time, by examination with the naked eye or with the magnifying glass. In both patients the iris was atrophied, and even the pigment layer was thinned in spots. Possibly, the pigmented border which normally bounds the iris by the side of the pupil may be absent in places, thus allowing the vessels to push loops into the pupil. In my second case these vessels were attached to the iris wherever the sphincter persisted. Upon Dr. Darier's drawing (January number, p. 35) I noticed that the vessels were not inserted near a synechia; in point of fact, there is an accumulation of pigment, and this would naturally prevent a vascular new formation. This is a mere hypothesis, which I shall, perhaps, be able to prove by microscopic examination; it is probable that, because of persistent irritation, I shall have to enucleate the eye of Leon L.—DR. L. LEPLAT.

ITEMS

The meeting of the American Medical Association will be held at Baltimore, May 7 to 10.

The annual session of the Ophthalmological Society of Heidelberg will be held on the 5th, 6th, and 7th of August.

ANNALES D'OCULISTIQUE

Volume CXIII.—Number 4.

April, 1895.

I.—ORIGINAL CONTRIBUTIONS

MEMOIRS

ON DOUBLE VERTICAL STRABISMUS AND SYMMETRICAL VERTICAL DEVIATIONS OF DEGREES LESS THAN STRABISMUS

By Dr. **GEORGE T. STEVENS.**

Although vertical deviations of the eyes in concomitant strabismus have been recognized from early times, their importance and their relations to other forms of strabismus have received scant attention.

That these deviations are of great importance, and that they are often in causative relation to lateral deviations, will, I believe, become evident to one who studies the subject of strabismus from the standpoint of the physiological relations of the eye muscles, and from the results of practical experience based upon such studies.

Historical.

Boyer (1) describes not only the lateral deviations in strabismus, but vertical and oblique forms. He also describes the deviations of the squinting eye in the two latter forms as upward or downward deviations, and figures each of the forms.

In the form called by him "oblique strabismus" he advised tenotomy of the superior as well as of the internal rectus muscle. He believed that there were simple, uncomplicated cases of converging, of diverging, and of vertical squint, and that oblique strabismus formed a distinct class.

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(1) **Recherches sur l'operation du strabisme, Paris, 1842.**

Gradually, it became a pretty well settled doctrine that in the ordinary converging strabismus there was also a tendency of the squinting eye to rise, so that the cornea pointed upward.

Von Græfe expresses the generally accepted view of his time (1) in his article on vertical squint.

His statement differs radically from that of Boyer, for he declares that it is "*the rule that in high grades of converging strabismus there is, at the same time, a deviation upward of the cornea, so that, at its position in the inner angle, its upper part is brought under the superior lid.* Also, that when looking sidewise, so as to bring the cornea away from the angle, it sinks more and more to the horizontal diameter of the palpebral opening."

He declares that such position of the cornea is impossible through the influence of the contraction of the internal rectus alone, and that it must result from the action of either the inferior oblique or of the superior rectus.

He also points out that in such cases as he has been able to examine, in which diplopia could be recognized, the image of the squinting eye tilted with its upper end outward in proportion as the image appeared lower than the other, and that, consequently, the vertical meridian of the squinting eye must tilt with its upper extremity inward.

From these facts, he draws the conclusion that the superior rectus participates in inducing the faulty position of the eye.

Notwithstanding these facts, he regards the excessive action of the superior rectus only as *an associated action*, indicating no original excess of tension on the part of that muscle, but only as a tension necessarily combined with the excess of tension of the internus. This he proves to his own satisfaction by adducing the other fact that if the sound eye is covered the originally squinting eye assumes the position of fixation, while the other, the sound eye, not only turns in, but also drifts upward.

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(1) *Archiv für Ophthalmologie*, Bd. II., opht. 2, 289, 1885.

This very important observation, misinterpreted, as we shall see, indicates the great care with which von Græfe made his examinations.

Von Græfe believed that all this tendency of the squinting eye to rise was abolished as soon as tenotomy of the internus permitted the eye to assume a position removed from the inner canthus. This last fact he regarded as the most convincing evidence that the excessive tension of the superior rectus is entirely sympathetic.

In extreme cases of upward deviation von Græfe, like Boyer, in rare instances performed tenotomy of the superior rectus after the internus had been divided (1).

Much later, the author of this paper (2) insisted that these vertical deviations were not sympathetic, but that the relation of the convergent strabismus to the vertical deviation was that of effect, and not of cause, as stated by von Græfe. The principle was advanced and emphasized that "the study of hypertropia (deviation of one visual line above the other), if not the most, is one of the most, important elements in the examination of any case of strabismus." It was held that "the unequal tension of the two pairs of superior and inferior recti is often responsible for an apparent converging or diverging strabismus, and that in many cases cures are attempted by operations on the lateral muscles which leave the cases in conditions worse than before the operations."

In a later paper (3) this principle is still further elucidated, and it is held that, "In the case of double images, whatever may be the difficulty of blending, the patient instinctively exerts his best endeavors to place the images in the same horizontal plane. It thus happens that in certain cases in which, either with or without slight lateral inequality of tension, the effort to bring images to the same plane induces a lateral squint." Attention was further called to a curious fact in connection with the inequality of tension of the lateral muscles associated with hyperphoria, which is, that "a condition which in a passive state of the muscles of either or of both eyes is a marked divergence becomes, as soon as all the muscles become engaged in the act of adjustment, pronounced convergence, attended by homonymous diplopia. Conversely, a like change may occur when the tendency is, in the passive state, to converge."

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(1) (*Archiv für Ophthalmologie*. Bd. III., Abth. I., p. 259.

(2) **Stevens**: Anomalies of the Ocular Muscles, *Archives of Ophthalmology*, 1889, No. 4.

(3) *Archives of Ophthalmology*, 1891, No. 3.

In these and subsequent papers I have often attempted to show, both from the physiological standpoint and from the practical results of operations performed upon the superior recti, that a large proportion of cases of lateral strabismus depend upon excessive tension of one or other of the vertically acting muscles, and that by proper relaxation of the muscles of greatest tension in this direction the lateral squint might be relieved.

Later Views of the Author.

More recently it has appeared to me that the views above expressed, while entirely correct, come short of a full comprehension of all the facts. Without doubt, the unequal tension of the vertically acting muscles may and do induce converging or diverging strabismus. But we may go further, and state that excessive tension of the corresponding vertically acting muscles of each eye may also induce lateral strabismus. In a paper read before the International Ophthalmological Congress held at Edinburgh in 1894 (1), I have called attention to the fact that there occur many instances in which both eyes deviate vertically and in the same direction, either equally or unequally, and that the excessive tension on the opposing vertically acting recti often causes the eyes to squint inward. Relief to this tension afforded to the vertically acting muscles of both eyes will also relieve the tendency to squint inward.

In a note to this article in the New York *Medical Journal* (2) it is shown that these double and more or less symmetrical vertical tendencies may induce also the lesser grades of lateral deviation, esophoria, and exophoria.

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(1) The Relation of the Function of Accommodation to that of Convergence. See Proceedings of the Congress.

(2) February 16, 1895.

This view of symmetrical deviations or deviating tendencies in the vertical direction, not the sympathetic result of inward deviation, was, so far as I am aware, an entirely new one, and it is the purpose of the present paper to call attention to some of the phenomena that may result from this condition, which has remained until so recently entirely neglected.

In order to avoid a repetition of descriptive words, I shall venture upon an enlargement of the system of terminology which I have already presented, trusting that the necessities of the case may be my excuse for introducing new terms.

The conditions which I am to discuss may be classified as:

1st. *Anotropia;* a deviation of the visual line of either eye upward when the other eye is in fixation.

2d. *Katotropia;* a deviation of the visual line of either eye downward when the other is in fixation.

Anotropia, *Katotropia*.

The simplest form of double vertical squint, that in which either eye deviates directly upward or downward when the other is in fixation, has not, I believe, been described previously to the description contained in my paper above alluded to, which was read in Edinburgh in 1894. In these cases the patient, in most instances, selects one eye for habitual fixation, while the other is permitted to diverge upward or downward. In the first instance, if, while the habitually fixing eye is directed toward an object, a visiting card is slipped between the eye and the object, the squinting eye is seen to move directly downward, while the eye behind the card rises in a line as exactly vertical as that through which the originally squinting eye descended, and to an extent approximately equal to the original squint (*Anotropia*). In several of these cases the patient has been able to exchange the fixation from one eye to the other at will. In these cases the action of the two eyes is identical with that which is shown when the card is used. If the left eye, for example, squints upward, and the patient is directed to fix with that eye, the observer can see the eye move directly downward, while the other rises as directly.

There is in these cases usually no more consciousness of diplopia than in other cases of concomitant strabismus, and there appears to be no possibility of bringing the two eyes to fixation at the same time.

What has been said of the cases in which one eye rises while the other is in fixation applies equally to the cases in which one sinks while the other fixes (*Katotropia*).

That this condition of double deviation is not very rare will probably be discovered when attention is drawn to it, for it is probable that a considerable proportion of the cases which have been known as strabismus sursumvergens and strabismus deorsumvergens belong to this class.

A more ordinary form of double vertical strabismus is that in which, by virtue of the fact that one eye rises or is depressed to a greater extent than its fellow, a converging or diverging strabismus results. It is possible that even in cases of equal upward or downward deviation from the normal direction such secondary squints may be induced. If one recalls for a moment the peculiar anatomical features of the insertions of the four recti muscles it will be seen how easy it may be for an inward deviation to occur, if the patient insists upon forcing both eyes to the plane of fixation at the same time. The superior and inferior rectus, having their insertions mostly on the nasal side of the vertical meridian of the eye, would naturally, if a vigorous effort is made by the inferior rectus, for example, to overcome the too great action of the superiors, induce a turning in, and my recent experience with cases of alternating strabismus suggests the belief that for the most part they belong to this class in which the vertical tensions are excessive, but nearly equal.

To the other class, in which, with excessive vertical tensions, the defect is unequal, appears to belong a large class of the cases known as ordinary converging strabismus.

Furthermore, inquiry is necessary to determine how large may be the proportion of simple converging squints, but my investigations lead me to believe that it will be found to be very small.

These very evident cases of double vertical deviation by no means constitute the whole of the anomalous cases of this class. If we assue that, the head being in the primary position, the chin neither projecting nor receding, the most correct position for the visual lines to rest when the least amount of enervation is exercised would be in the horizontal plane, then a very large number of cases find themselves in the class of such deviations as may be controlled by the individual, but only by the exercise of such continuous nervous action as to induce fatigue or nervous reaction. Indeed, some of the most serious forms of nervous reaction find their origin in this continuous effort to overcome a tendency of the visual line to rise above or to fall below the horizontal plane under the circumstances described.

These conditions may induce lateral deviating tendencies, and are often the cause of them. It is easy to see that esophoria may be induced by the increased tension of the vertically acting recti, and as a matter of fact, although it is much less easy to explain, exophoria is a frequent result of these double but somewhat unsymmetrical vertical tensions.

It will be seen from what has been stated that the plane of easiest regard should be considered in our examinations and our corrections of heterophoria. It had been my good fortune to correct some cases of esophoria and of exophoria by such carefully planned and executed relaxations of each of the superior or of the inferior recti as to bring the eyes to a plane much more favorable for the ordinary adjustments than the one originally occupied.

Indeed, we find certain cases in which a correction of esophoria or of exophoria cannot be made by relaxations of the lateral muscles short of a restriction of the rotations of the eye toward the operated muscles, which is injurious and unwarrantable. But if in these cases the too great effect of the superior recti, or of the inferior recti, as the case may be, is reduced, a full correction of the esophoria or exophoria may be made, if indeed such a correction is still required.

Even when the deviating tendency either up or down is apparently quite symmetrical, it may induce little deviating tendency in the lateral direction. The condition may, however, induce much nervous disturbance.

It is evident from what has gone before that these cases demand treatment similar to, but in some instances more radical than, the treatment applied to heterophoria.

It is rare that prisms sufficiently strong to be of very material service can be used, and tenotomy is often required. In hyperphoria or in esophoria one may operate for a very low grade of deviating tendency, but in the cases which we have under discussion an operation would scarcely be required, unless the upward or downward rotation of the eyes should be found to be materially restricted.

It remains to describe more in detail some of the effects of these anomalous conditions upon other muscular tensions, and upon the nervous and physical condition of those subject to these defects; to point out the methods employed for determining the direction and amount of these deviating tendencies, and to discuss more at length the treatment of these conditions.

(*To be continued in the next number.*)

THE REFRACTIVE POWER OF THE EYE AND THE AMPLITUDE OF ACCOMMODATION

By Dr. **WEISS,**

Adjunct Professor of Physics of the Faculty of Paris.

In vision at various distances, first at far points and then nearer, the refractive power of the eye increases by the act of accommodation. The maximum of this increase of the refractive power, for a given person, corresponds to what is called the amplitude of accommodation.

How may this increase be calculated?

In vision at near points the accommodation may be replaced by putting a converging lens before the eye; certain authors consider that the strength of this lens measures the accommodation.

Let me give an example. The near point of a certain person is 10 centimetres in front of the anterior focus of his eye; he can, by placing a lens of 10 dioptres at the anterior focus, see at the near point without accommodation. It would then be said that his amplitude of accommodation was 10 dioptres.

I have supposed that the anterior focus of the eye is taken as the point of origin of measurements, as it is properly there that correcting glasses are placed.

To what does this method of evaluation correspond? Does the refractive power of the eye increase 10 dioptres in the act of accommodation? Or rather, is the system formed by the eye and the lens 10 dioptres stronger than the eye alone?

Let us see in this particular case what is the increase of the refractive power of Listing's reduced eye in the act of accommodation.

The term refractive power of a central system is generally given to the inverse of the focal distance—that is, the inverse of the distance expressed in metres of a focus from the corresponding principal plane.

In Listing's reduced eye this distance for ordinary rays of light is about 0.02m.; therefore the refractive power of the eye without accommodation is 50 dioptres.

When the eye accommodates, the image is always 0.02m. behind the principal plane, and the object is 0.115m. in front, for the anterior focus of the eye is 0.015m. in front of the principal plane. By substituting these two values in the dioptric formula we will obtain the required refractive power.

This formula is $\frac{1}{np} + \frac{1}{p^1} = \frac{1}{f}$

Give n the value 1.33; we will then have

$$\text{II} = \frac{1}{f} = \frac{1}{1.33 \times 0.115} + \frac{1}{0.02}$$

$$\text{or II} = 6.5 + 50$$

That is to say, that to accommodate, the dioptric condition of the eye has increased 6.5 dioptres. It is seen that this increase is by no means measured by the strength of the lens which can replace the accommodation.

But another curious fact presents itself. In calculating the refractive power of the total system formed by the eye and the lens, I have found that whatever was the strength of this lens, the total system always had the same refractive power as the eye alone. This may be easily demonstrated by a geometrical figure.

Consider a dioptric system having its principal point at S, its centre at C, and its foci at f and f_1. Place at f_1 a lens whose focus shall be, for example, at F. It is easy to find the focus and the corresponding principal plane for the entire system. A ray XA parallel to the principal axis will take, after traversing the lens, the direction AF, then will be refracted a second time on encountering the surface of the dioptric. To find a point of the emergent ray it is sufficient to draw through the centre C a parallel to AF. The point B, where this parallel meets the focal plane, belongs to the required ray. To find its direction,

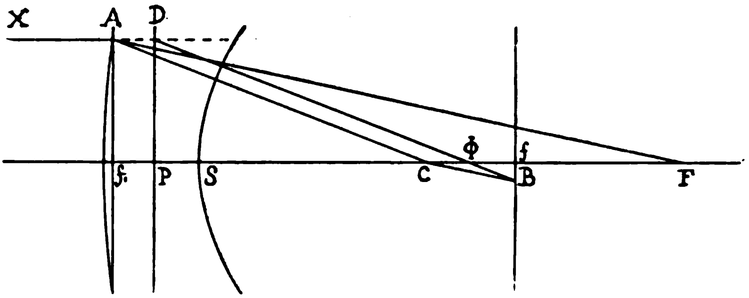

Fig. 1.

draw the line CA. The refracted ray is DB drawn through B parallel to AC; the point ϕ, where it meets the axis, is the focus of the system; the point D where it cuts XA prolonged is in the principal plane, which is therefore DP. The focal distance of the entire system is Pϕ. But the two equal triangles, DPϕ and Af_1C, give Pϕ = f_1C. But we know that f_1C is equal to Sf, therefore the addition of the lens before the dioptric system has not changed the focal distance, and consequently the

refractive power, of the system. The focus and the principal plane are carried forward by the same amount, $\phi f = SP$. This distance is easy to calculate, for we have:
in the similar triangles $\phi f B$ and Cf_1A

$$\frac{\phi f}{Cf_1} = \frac{Bf}{Af_1}$$

but in similar triangles, BfC and Af_1F, we also have

$$\frac{Bf}{Af_1} = \frac{Cf}{Ff_1} \text{ whence } \frac{\phi f}{Cf_1} = \frac{Cf}{Ff_1} \text{ and } \phi f = \frac{Cf \times Cf_1}{Ff_1}$$

Let f^2 be the focal distance of the dioptric system and F that of the lens. We then have as the required displacement

$$\phi f = \frac{f^2}{n} \times \frac{1}{F}$$

In the case of the eye, by substituting for f^2 and n their values

$$\phi f = 0.0003 \times \frac{1}{F}$$

Therefore :

When a converging lens is placed at the anterior focus of the eye, the refractive power of the system is not changed. The principal plane and the focus are simultaneously carried forward by a quantity proportional to the strength of the lens, 0.3 millim. for each dioptre.

In the particular case chosen above of a lens of 10 dioptres the displacement was 3 millimetres.

I may add that a diverging lens produces the same displacement in the inverse sense.

If the convergent lens is placed nearer the eye the refractive power increases; if it is placed further away, it diminishes. Thus the refractive power of an eye supplied with a converging glass may be inferior to that of the eye alone.

It will be seen that physiological accommodation and artificial accommodation produced by a converging glass placed before the eye are in no way to be compared; the one cannot be measured by the other.

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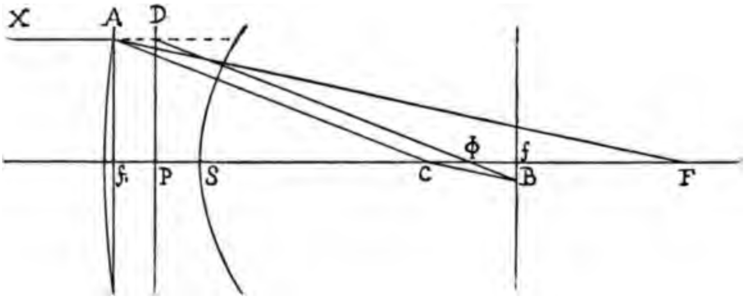

Fig. 1.

refractive power, of the system. The focus and the principal plane are carried forward by the same amount, $\phi f = \text{SP}$. This distance is easy to calculate, for we have:
in the similar triangles $\phi f\text{B}$ and $\text{C}f_1\text{A}$

$$\frac{\phi f}{\text{C}f_1} = \frac{\text{B}f}{\text{A}f_1}$$

but in similar triangles, $\text{B}f\text{C}$ and $\text{A}f_1\text{F}$, we also have

$$\frac{\text{B}f}{\text{A}f_1} = \frac{\text{C}f}{\text{F}f_1} \text{ whence } \frac{\phi f}{\text{C}f_1} = \frac{\text{C}f}{\text{F}f_1} \text{ and } \phi f = \frac{\text{C}f \times \text{C}f_1}{\text{F}f_1}$$

Let f^2 be the focal distance of the dioptric system and F that of the lens. We then have as the required displacement

$$\phi f = \frac{f^2}{n} \times \frac{1}{\text{F}}$$

In the case of the eye, by substituting for f^2 and n their values

$$\phi f = 0.0003 \times \frac{1}{\text{F}}$$

Therefore :

When a converging lens is placed at the anterior focus of the eye, the refractive power of the system is not changed. The principal plane and the focus are simultaneously carried forward by a quantity proportional to the strength of the lens, 0.3 millim. for each dioptre.

In the particular case chosen above of a lens of 10 dioptres the displacement was 3 millimetres.

I may add that a diverging lens produces the same displacement in the inverse sense.

If the convergent lens is placed nearer the eye the refractive power increases; if it is placed further away, it diminishes. Thus the refractive power of an eye supplied with a converging glass may be inferior to that of the eye alone.

It will be seen that physiological accommodation and artificial accommodation produced by a converging glass placed before the eye are in no way to be compared; the one cannot be measured by the other.

Certain authors assume, as origin of their measurements in the eye, the optical centre of the reduced eye, calculating the accommodation by the strength of the ideal lens, which, placed in this optical centre, will replace the accommodation. This lens, placed 0.02m. behind the anterior focus, should have a focal distance greater by 0.02m. than that of the lens thus far considered—that is, 0.12m., which corresponds to 8.3 dioptres. It will immediately be seen that by this method the increase in the refractive power of the reduced eye is not measured.

In Fig. 2 I have represented three curves, giving at different ages of life the value of the amplitude of accommodation calculated by three methods which I will enumerate.

The first is Donders's curve. It gives in dioptres the strength of the converging lens which, placed before the eye at the anterior focus, will replace the accommodation.

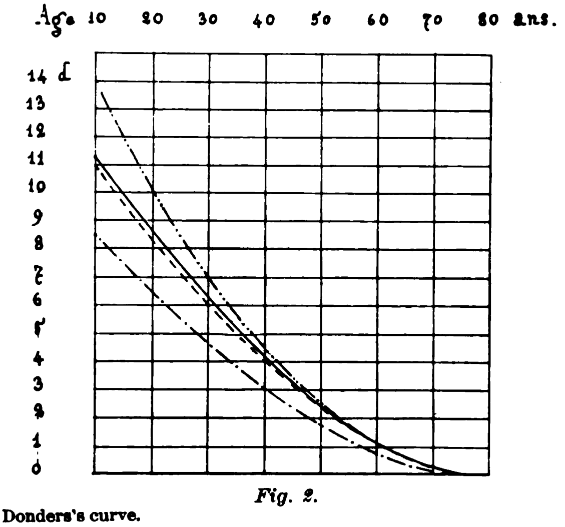

Fig. 2.

-·———-- Donders's curve.

- - - - - - - - Power of the lens placed at the optical centre.

——— - ——— - Increase of refractive power of the reduced eye.

———————— The common curve for the power of the lens placed at the principal plane and the increase of the power of the reduced eye by the new definition.

The second corresponds to the ideal lens placed 2 centimetres behind the former—that is, at the optical centre of the eye—and producing the same effect on accommodation.

Finally, the third curve represents the increase of refractive power of the reduced eye in physiological accommodation.

It will be seen how these three curves differ from each other; inspection of the diagram is more instructive than any discussion on the possibility of replacing the third by one of the other two.

In an article which appeared recently (1) I proposed a new general definition of the refractive power of a central system which, by its adoption, removes all difficulty.

According to this definition, the refractive power of any central system is considered as *the inverse of the focal distance multiplied by the index of refraction of the last medium.*

I will not record here the considerations which led me to this conclusion, but will simply point out its principal advantage.

When two thin lenses are placed one behind the other their refractive power increases algebraically; this is a great advantage for practical calculation. But when this operation is extended to dioptric systems it will be seen that, with the former definition of refractive power, the law of addition does not hold. On the contrary, by adopting that which I have proposed, algebraic addition of the refractive powers of the lenses and the dioptric systems is made as with lenses alone. There is nothing to change in the refractive power of lenses, as the index of refraction of the last medium is unity.

Let us apply this to the refractive power of the eye and the amplitude of accommodation.

The index of refraction of the last medium is about 1.33; the refractive power of the non-accommodating eye will then be

$$50 \times 1.33 = 66.5 \text{ dioptres.}$$

As for the accommodating eye in the conditions of the example given above, its refractive power will be

$$56.5 \times 1.33 = 75.1 \text{ dioptres.}$$

There will then have been an increase in the refractive power of 8.6 dioptres. This increase is exactly measured by the ideal glass, which, placed in the principal plane of the reduced eye, will replace accommodation. This glass should be 0.015m. behind the anterior focus; it should therefore have a focal distance equal to

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(1) The refractive power of central systems. (*Revue des sciences pures et appliquées*, Dec. 30, 1894, and Congress of the French Society for the Advancement of Science.)

0.10 × 0.015m. = 0.115m.; which gives 8.7 dioptres.

The difference of 0.1 dioptres comes from the neglected decimals in the arithmetical calculations.

We have then:

The strength of the ideal lens, which, placed in the principal place, will replace accommodation, measures exactly the accommodation—that is, the increase in the refractive power of the reduced eye; on the condition of assuming as general definition of refractive power the inverse of the focal distance multiplied by the index of refraction of the last medium.

I think that there is good reason for adopting this new definition, and for taking the principal plane as origin of measurements in the reduced eye, and not the optical centre, as the majority of authors have done.

I will add that the same reasons apply to the correction of myopia and hypermetropia.

DIPHTHERITIC CONJUNCTIVITIS; ITS TREATMENT WITH ANTITOXINE SERUM

By Dr. **V. MORAX,**
Late Hospital Interne.

By the term diphtheritic conjunctivitis is meant a conjunctival affection of which the diphtheritic bacillus is the cause. If there is unanimity of opinion on the definition of the disease, there is not as yet complete accord as to its clinical characters. It does not, therefore, seem superfluous, before studying the treatment of this form of conjunctivitis, to review the precise observations, based upon bacteriological examinations, which permit us to recognize it.

Without entering upon the history of this question, let me simply say that von Græfe, in his classical memoir, described all the forms of conjunctivitis with pseudo-membranous exudations, with the purpose of differentiating them from the purulent forms of conjunctivitis, and of showing that nitrate of silver, so useful when there is secretion from the mucous membrane, can be dangerous when this secretion is dry and infiltrated (1). The diphtheritic qualification which signifies pseudo-membranous infiltration or exudation was opposed to that of gonorrhœa—that is to say, of purulent or muco-purulent exudation. But from this somewhat confused work is retained as of most importance the existence of a grave form of pseudo-membranous conjunctivitis characterized by infiltrations, a ligneous condition of the lids, and corneal complications of rapid evolution, and for this affection was reserved the name of diphtheritic conjunctivitis. Later, from the standpoint of pathological anatomy alone, and not without protests on the part of some ophthalmologists, more clinicians tham histologists, true diphtheritic conjunctivitis was distinguished from croupous conjunctivitis, placing in this class the cases of conjunctivitis with superficial pseudo-membranous exudation and benign issue. Numerous attempts based on clinical and anatomical study were made with the purpose of shedding further light on this subject, but the results were only satisfactory to the authors and this chapter of nosography, one of the most obscure, until several observers undertook to apply bacteriological analysis to the diagnosis of membranous conjunctivitis, which, in the hands of Loeffler, of Roux, of Yersin, and of Martin, had given such precision to pharyngo-laryngeal diphtheria. Uhthoff describes a case of croupous conjunctivitis in which he was able to isolate a virulent diphtheritic bacillus, but the first important work is that of my colleague, Sourdille, based on the personal examination of six cases. Then came a second article by Uhthoff, and the observations of Schirmer. To-day, then, the question of diphtheritic conjunctivitis may be regarded in a scientific manner by considering those precise facts obtained from simultaneous clinical and bacteriological study and disregarding, at least for the moment, all which arises from clinical observation alone.

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(1) According to von Græfe, the danger of using nitrate of silver in diphtheritic convunctivitis should become a dogma. It does not, therefore, seem out of place to give the text of one of the conclusions of his memoir : "To give a good practical idea of the use of caustics, one should depend in every case (without stopping to consider the name of the affection) on the characteristics of the mucous membrane. If these are blennorrhœic, free applications should be employed, as this is the best and surest method of cure, even if there are extensive lesions of the cornea. If the mucous membrane is diphtheritic, cauterization is contra-indicated, and even if there is no perception of light, cauterization should not be made, as it will only bring on panophthalmitis with phthisis bulbi. If the mucous membrane presents a double blennorrhœic and diphtheritic character, cauterization should at times be made. and then suspended, according to the modifications of the local conditions."—A. VON GRÆFE : *Diphtheritic conjunctivitis and the use of caustics in acute inflammations.* (*Arch. f. Ophthalm.*, 1854, Vol. I.)

That which at the outset attracts the attention is, that contrary to what has been thought, ocular diphtheria seems most frequently to be a benign affection, only having a serious prognosis by reason of the diphtheritic nasal or laryngo-pharyngeal complications which may result from it (1). Indeed, the observations of Uhthoff and Schirmer relate to light cases and cases of benign development without or with insignficant corneal lesions. Only two of Sourdille's cases were accompanied with corneal infiltration and perforation of this membrane. In the five cases which I studied the affection was benign.

I should, it is true, add that some observers have attributed this benignity of ocular diphtheria to the therapeutics employed. But as the treatment of each observer differed from that of the others, it seems to me more rational, at the risk of treating lightly the opinions of my colleagues, to consider this benignity as one of the frequent characteristics of the affection.

From the clinical standpoint, diphtheritic conjunctivitis is characterized by a pseudo-membranous exudate covering the tarsal conjunctiva and only exceptionally affecting the bulbar conjunctiva. The exudate is sometimes intimately connected with the subjacent mucous membrane, so that it is separated from it with difficulty; on the other hand, at other times it simply forms a covering for the congested mucous membrane, and a slight rubbing suffices to dislodge it. In the language of the old school of pathological anatomy, the lesions in the first case were diphtheritic, and in the second, croupous; but we know to-day that the lesions have no specific character in themselves, that the same micro-organism may produce lesions sensibly different according to the virulence of the microbe with which it is associated, and that a disease cannot be defined by one of its lesions.

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(1) These complications have been quite frequently noted, and the fact is very interesting as opposed to the extreme rarity of diphtheritic conjunctivitis in children with primary laryngo-pharyngeal diphtheria. In the isolated pavilion of the Children's Hospital ocular diphtheria is altogether exceptional.

I have already stated that corneal lesions are lacking in the majority of cases. In some cases the characters were not markedly different from those usually observed in phlyctenular eruptions of the cornea, which so frequently accompany impetiginous eruptions of the face and scalp. Schirmer, however, noticed in the cases which he observed more marked and extensive corneal leucomas.

As for the lids, except a more or less marked amount of swelling, they did not present peculiar symptoms. In no case was that ligneous hardness of the lids noticed, or the impossibility of everting them to examine the tarsal conjunctiva.

In a few cases the disease left behind it small conjunctival cicatrices ; as for its duration, it varied between one and three weeks.

It will be seen from this brief review that we are far from that disease which the term diphtheritic conjunctivitis has caused to be dreaded above all. What should be remembered is that it may be grave, but is generally benign.

Is it possible to make a diagnosis from the clinical symptoms of the disease? I do not think so, and my conviction is based on bacteriological examinations which have proved the complete absence of diphtheritic bacilli in cases which presented identical clinical signs with those in which plate and serum cultures revealed the presence of these micro-organisms.

Only facts relating to the existence of laryngo-pharyngeal diphtheria in the neighborhood of the patient, in the house where he lives, or, finally, the discovery of diphtheritic coryza, tonsillitis, or laryngitis in the patient himself, can suggest ocular diphtheria in a patient with pseudo-membranous conjunctivitis.

In conjunctival affections, as in pseudo-membranous laryngo-pharyngeal manifestations, a precise diagnosis may only be obtained by bacteriological examination. I should add, however, that we have a quite rigorous method of diagnosis in the use of specific treatment with serum antitoxine. The importance of a rapid diagnosis is evident, not only from the standpoint of the patient and the early application of a curative treatment, but also from the standpoint of the dangers of contagion to others.

It does not seem necessary for me to enter upon the method of procedure of bacteriological diagnosis by serum cultures. There are, however, two points to which I wish to call attention: one the utility of a microscopical examination of the conjunctival exudate, and the other the necessity of inoculating isolated diphtheritic bacilli in guinea-pigs.

In my article on the etiology of acute conjunctivitis I have already laid stress on the interest and utility of examination of fresh specimens of the conjunctival exudate, a rapid form of examination which permits precise results to be obtained in a very short time. In a certain number of cases of acute conjunctivitis the conjunctival exudate, examined under the microscope, only contains the species of microbe which is the etiological cause of the inflammation, and these micro-organisms (gonococcus, bacillus of acute contagious conjunctivitis) are those which develop poorly, or not at all, under the usual conditions of a culture. If, then, the examination of fresh specimens is neglected, and the diphtheritic bacillus develops in the serum culture, one would be inclined to think that it alone was the cause of the trouble, while in reality it only took part in the pathological process in virtue of the lesions primarily caused by the gonococcus, the bacillus of Wecks, or some other such microbe. Furthermore, in pronounced cases of ocular diphtheria extemporaneous examination of fresh specimens has shown diphtheritic bacilli so abundant and characteristic that I have been able immediately to affirm the diphtheritic nature of the disease.

When the coagulated serum culture has produced, after remaining from twelve to twenty-four hours in the oven, a development of grayish, projecting colonies, formed by bacilli of irregular form which take Gram's stain, one is not yet authorized to state that they are diphtheritic bacilli. There may be strong presumption if the colonies are very numerous, but it is necessary in all cases to make beef-tea cultivations of isolated bacilli for inoculation in the sub-cutaneous connective tissue of guinea-pigs. Inoculation alone, which demonstrates the virulence of the micro-organism, permits a differentiation to be made between the diphtheritic and the pseudo-diphtheritic bacillus so common on the conjunctiva. It is known that the differentiation between these two microbes is based especially on the factor of virulence, and that it has always been impossible to produce, experimentally, virulent symptoms from pseudo-diphtheritic bacilli, while it is possible to so attenuate a diphtheritic bacillus that it becomes inoffensive. In ocular diphtheria the diphtheritic infection appears always to be secondary. This is a fact to which certain clinicians have already drawn attention, and which Uhthoff and Sourdille noticed in their observations: it may be measles, blepharitis, phlyctenular conjunctivitis, or acute conjunctivitis which forms the primary affection on which the diphtheritic bacillus grafts itself. It is asked if, under the influence of the microbes which determine the primary affection, the inoffensive diphtheritic bacillus may become virulent. Up to the present time no experience authorizes this supposition, and if clinical analysis is relied upon it will be found that contagion is noted in numerous cases, and that there are only a small number of cases in which it was possible to find in the neighborhood of the patient a clear case of laryngo-pharyngeal or ocular diphtheria.

Uhthoff and Fraenkel have in several cases found virulent diphtheritic bacilli in the healthy conjunctiva, and they have thought that this discovery is of a nature to destroy the precision of bacteriological diagnosis. I have examined the conjunctival cul-de-sacs of quite a large number of cases, both in healthy persons and in the course of various ocular affections, without ever finding virulent diphtheritic bacilli. It is true that my examinations were not made on hospital patients, and it is quite possible that in making further researches a virulent diphtheritic bacillus might be found in certain persons at a given time; but what I wish to call attention to is that in diphtheritic conjunctivitis there are only one or two colonies of virulent bacilli found, but that in the cultures the colonies are in relatively greater numbers, that the bacillus may be found in the exudate on microscopical examination, and that therefore there can be no doubt as to the rôle played by it in these lesions.

There is finally one point which it seems proper for me to mention. Sourdille in his article considers that the gravity of ocular diphtheria depends on the virulence of the diphtheritic bacillus and on the character of the associated microbes; the association of the streptococcus will more especially determine the severe forms. Thus presented, this proposition does not seem quite exact to me, and Uhthoff has already noticed that in three cases of benign diphtheritic conjunctivitis (croupous form), the bacillus of Loeffler was associated with the streptococcus and the staphylococcus. I have found the same thing, and it seems to me rather that the gravity depends on the lesions caused by the primary infection, which becomes complicated with the diphtheritic bacillus. Suppose, for example, that instead of being limited to the conjunctiva, the phlyctenular eruption which so frequently accompanies impetiginous lesions of children's faces developed at the same time on the cornea; if the diphtheritic bacillus appeared, the disease, benign in the first case, could become very grave in the second, and yet in both cases the streptococcus would be found. In ocular diphtheria it is, in fact, the corneal lesions which determine the prognosis.

I will now describe four cases of diphtheritic conjunctivitis which I have studied, and which were treated with serum antitoxine.

Conjunctival, Nasal, and Laryngeal Diphtheria Following Measles; Tracheotomy; Treatment with Serum; Recovery.

Case I.—Lad——, René, six and a half years old, was received on February 24, 1894, in the isolated diphtheria ward of the Children's Hospital. Eight days before his entrance in the hospital the child had been attacked with measles and had had conjunctivitis and coryza.

On February 24 there was found quite a marked swelling of the tonsils without false membranes. There was no cough, and decided difficulty in breathing necessitated immediate tracheotomy. The operation was performed the same day at 11 o'clock in the evening.

On the day before some disturbance of the conjunctiva had been found. On February 25 there was a pseudo-membranous exudate on the tarsal conjunctiva of both sides. Drs. Roux and Martin asked me to examine the conjunctival lesions, and I made the following notes:

The lids of both eyes were somewhat swollen and thickened without induration. At the internal angle was found a scanty secretion, a little more marked in the right than in the left eye, which had caused a slight erythema of the corresponding region. The bulbar conjunctiva was somewhat injected, but the cornea of both eyes was healthy. On everting the lids, which was easily done, there was found on the tarsal conjunctiva a yellowish-white false membrane, thick, fatty in appearance, and adherent to the subjacent mucous membrane. This could not be raised up without causing the mucous membrane to bleed. There was no engorgement of the preauricular ganglion.

On February 24 the first injection of 30 c. c. of antitoxine serum was made, and a collyrium of nitrate of silver $\frac{1}{40}$ was instilled in each eye. February 26, the general condition was not decidedly modified. There was, however, a certain improvement of the tarsal conjunctiva. A second injection of 20 c. c. of serum and a second instillation of nitrate of silver was made. February 27, the improvement of the pseudo-membranous conjunctivitis was quite marked. The false membrane which formed a uniform layer was now limited at several points. Another injection of 15 c. c. was deemed necessary from the general condition, which was still bad. March 1, the swelling of the lids had completely disappeared. On the right side only, on the tarsal conjunctiva of the lower lid, a small whitish spot was found. The cornæ were intact. The conjunctival injection and secretion were very slight. March 3, the recovery of the ocular lesions was complete.

I will not dwell upon the later pulmonory complications (bronchopneumonia) presented by the patient, which nevertheless resulted in complete recovery.

Bacteriological Examination.—Cultures of the false laryngeal membranes, made by Dr. Martin, proved the existence of long and large diphtheritic bacilli associated with a coccus. An injection of 1 c. c. of a twenty-four-hour beef-tea culture of this diphtheritic bacillus killed a guinea-pig in eighteen hours with the characteristic lesions.

February 25, we made three serum cultures with the product of the scrapings of the false conjunctival membranes. In twenty-four hours abundant colonies of diphtheritic bacilli developed. No other micro-organism developed. One c. c. of a twenty-four-hour beef-tea culture injected under the skin of a guinea-pig killed the animal in three days with sub-cutaneous œdema, pleural effusion, and congestion of the supra-renal capsules.

March 1, two new cultures were made. On the next day only four or five diphtheritic colonies had developed in each tube. There were, however, other colonies formed by a coccus. Inoculation of 3 c. c. of a twenty-four-hour beef-tea culture killed a guinea-pig in twenty-four hours.

Monocular Conjunctival and Palpebral Diphtheria; Injection of 10 c. c. of Serum; Recovery.

Case II.—M. Coud, thirteen months old, was brought to Dr. Parinaud's clinic on January 8, 1895. The mother told me that the patient's sister had been sick five weeks before with scarlatina complicated with diphtheritic tonsillitis and laryngitis, and had been treated with serum at the isolated ward of the Children's Hospital. This child had left the hospital three weeks after her entrance, and was now very well.

My little patient already had an impetiginous eruption at the root of the ear and on the scalp when his sister returned from the hospital. About the 3d of January the upper lid of the left eye became the seat of an analogous lesion to that which existed behind the ear. A short time after, the lids became swollen and remained closed. To these lesions were added a slight fever and loss of appetite, which decided the mother to seek advice.

On January 8 I found the following symptoms: The child was pale, prostrated, and cried continually. The eyes were firmly closed. On the lids of the left eye was a thick, brownish crust, easily removed, and leaving behind it a bleeding ulcerated surface. On everting the lids, which was done without difficulty, the tarsal conjunctiva appeared covered with a grayish, fatty, pseudo-membranous exudate, adherent to the subjacent mucous membrane, which bled when an attempt was made to remove it. The bulbar conjunctiva was somewhat injected, but there was no false membrane. The cornea was intact. The conjunctival secretion was very slight. The pre-auricular ganglion on the left side was somewhat increased in size. The right eye was slightly injected, but the conjunctiva showed no trace of a false membrane.

On and about the left eye was a region of impetigo. There were no pharyngeal or laryngeal disturbances. From the history a diagnosis of diphtheritic conjunctivitis was made, and until the next day applications of boracic acid compresses were prescribed to remove the crusts.

On January 9 the crusts on the lids only reappeared at a few points. In other parts the ulcerated skin was covered with a grayish false membrane having the appearance of cutaneous diphtheria. On the forehead were two small impetiginous plaques without false membranes. The lids were no more swollen than the day before, and were not hard or infiltrated. The tarsal conjunctiva was covered with a grayish exudate limited by the borders of the lids. The bulbar conjunctiva was slightly injected, and presented at the nasal side one or two spots covered with small limited pseudo-membranous exudates. The cornea was intact. In the right eye was a mild conjunctival catarrh without false membrane.

Bacteriological examination made the day before confirmed the diagnosis of diphtheria, and an injection of 10 c. c. of Roux's antitoxine serum was made.

January 10.—The mother found some improvement in the general condition. The child was less prostrated, and had partly opened the lids. The cutaneous lesions looked better. Changes in the conjunctiva were less apparent at first. It was noticed, however, that the borders of the false membrane were more easily raised and showed a tendency to spontaneous detachment. There were no corneal lesions.

January 11.—Improvement was more evident. The child was less prostrated. The cutaneous lesions only showed an ulcerated surface without false membrane. With the exception of one or two spots of 1 to 2 millimetres in extent the tarsal conjunctiva was no longer covered with a pseudo-membranous exudate. The lids of the left eye were open. The corneæ showed no trace of disturbance.

January 12.—The conjunctiva was completely clean.

On the following days cicatrization of the cutaneous lesions was rapidly effected. I saw the patient again on January 19. The palpebral lesions were almost completely cicatrized, and the conjunctiva no longer showed any traces of the former disease.

Bacteriological Examination.—On January 8 a fresh specimen of the false membrane was examined. Under the microscope were found chains of cocci, and in some leucocytes clusters of cocci. Between the leucocytes were also seen, but in smaller numbers, quite long diphtheritic bacilli.

Three tubes of serum were fertilized with the false conjunctival membrane, and one tube with the false cutaneous membrane. In all the tubes there developed in twenty-four hours colonies of diphtheritic bacilli, a smaller number of yellow colonies of aureus, and a few scattered colonies of streptococcus.

A gelatine culture made from the false conjunctival membrane showed on the following day numerous colonies of streptococci and a few of aurei.

The isolated diphtheritic bacilli were injected in the dose of 1 c. c. of a twenty-four-hour beef-tea culture under the skin of a guinea-pig weighing 500 grammes. The animal died in forty-eight hours with a marked œdema at the point of inoculation, a slight serous effusion in the pleura, and congestion of the supra-renal capsules.

Conjunctival and Nasal Diphtheria; Injection of 20 c. c. of Serum; Recovery.

Case III.—Marius, thirteen months old, was brought to Dr. Parinaud's clinic on February 26, 1895, for an ocular trouble, which had commenced one week before, and which for three days had been much aggravated.

The child, always well, was strong and well developed. The only antecedent history was an attack of laryngitis stridulus in December, 1894. Eight days before there had appeared on the scalp and in the retro-auricular fold a quite distinct impetiginous eruption. About the same time the mother had noticed that the lids were glued together on awaking, and that there was some lachrymation. The conjunctival secretion was very slight. The ocular affection was accompanied with some photophobia, but the child did not complain, and the mother attached no great importance to it.

A few days after the commencement the disease suddenly assumed a more serious aspect. On February 23 it was noticed that the lids of both eyes were swollen, and that the child only opened the eyes with difficulty. Its general condition was altered ; it was feverish and restless. February 25, the palpebral swelling had increased and the lids remained closed. A large quantity of clear mucus flowed from the nostrils, and several fits of coughing were added to the other symptoms.

On February 26, when the patient was brought to me, the lids of both eyes formed large œdematous pads ; the lids, however, were supple, and it was easy to evert them. There was found in the entire extent of the tarsal mucous membrane a pseudo-membranous exudation of grayish-white color, more or less œdematous in portions, and which it was impossible to detach from the mucous membrane. The cul-de-sacs, also, were covered with the same exudate. The bulbar conjunctiva was injected and slightly chemotic. Both corneæ were intact. A large amount of clear fluid escaped, which did not settle on the lids.

The pre-auricular and sub-maxillary ganglions were not hypertrophied. The nasal mucous membrane about the nostrils was covered with a uniform whitish exudate. The pharynx showed no pseudo-membranous lesions.

This was, therefore, a case of conjunctivitis with pseudo-membranous coryza. I immediately made an injection of 10 c. c. of Roux's serum under the skin of the abdomen and prescribed simple lotions of hot water.

February 27.—The child had had a calmer night than the preceding, and in the morning was gayer and opened the lids spontaneously.

Their swelling had not sensibly diminished, but on everting the lids the false membranes were seen to be exfoliated in large surfaces, and they were removed from the entire conjunctival surface by gentle rubbing with a tampon of cotton. The false membranes were less œdematous and more opaque. The subjacent tarsal conjunctiva was less œdematous.

The flow of mucous from the nose had been much less abundant. There was, in fact, a notable improvement, which the child's mother was the first to notice.

February 28.—The improvement found the day before did not persist, and the condition was the same as on the first day, before the injection of serum. The false membranes were again adherent, the child was restless and moaned considerably. The night had been a bad one.

The corneæ were intact, but the palpebral swelling was not modified. The child had not opened its eyes since the day before.

Another injection of 5 c. c. of Roux's serum was made. No other treatment was employed.

March 1.—The night had been a quiet one. On waking in the morning, the child had opened the lids. The false membranes were no longer adherent to the subjacent mucous membrane, which was much congested. A current of water removed them completely. The corneæ were intact, and the swelling of the bulbar conjunctiva was much diminished.

A third injection of 5 c. c. of serum.

March 2.—The child had slept very well. It had recovered its gayety, and since morning the eyes were wide-opened. The palpebral œdema was scarcely noticeable. Only a very thin pseudo-membranous exudate remained on the tarsal conjunctiva of the lower lid, which was removed with a fine jet of water. The corneæ were intact and showed no trace of disturbance. The mother had noticed that several false membranes had escaped from the nostrils. The general condition was excellent.

March 3.—No more traces of false membranes. The conjunctivæ were slightly injected, but there was no secretion, and the palpebral œdema had disappeared.

March 7.—Everything had regained its former condition. There was only found in the lower left conjunctival cul-de-sac a limited surface, smoother and whiter than the rest of the mucous membrane, which seemed to be a superficial cicatrix.

Bacteriological Examination.—Examination of fresh specimens of pseudo-membranous exudate reveated numerous bacilli, quite long, and of irregular form, which were colored with Gram's stain. Some were free, and others were enclosed in leucocytes. With the exception of this bacillus, only a small number of diplococci were seen.

Three tubes of serum fertilized on February 26 showed on the next day numerous typical colonies of diphtheritic bacilli. In the first two only there were, besides, several small grayish colonies. In a gelatine culture the colonies of streptococci were more numerous, while the diphtheritic colonies were few in number.

Isolated diphtheritic bacilli transferred to beef-tea produced there a fine deposit on the sides of the glass : 1 c. c. of a twenty-four-hour culture, inoculated under the skin of a guinea-pig, killed it in two days, with œdema at the point of injection, pleural effusion, and congestion of the supra-renal capsule.

The isolated streptococcus produced a flocculent deposit in the beef-tea ; 1 c. c. of this culture injected into the cellular tissue of the ear of a rabbit produced the next day a slight swelling and diffuse redness of the ear, but these disturbances diminished on the second day, and there was no trace of them on the fourth.

On February 28 examination of fresh specimens and of serum culture proved the presence of diphtheritic bacilli in abundance.

On March 1 I made a serum culture of the conjunctival mucus of the patient's mother. The result was negative in reference to the presence of diphtheritic bacilli.

On March 7 I made a serum culture of the child's conjunctival mucus, but no diphtheritic colonies developed.

From an etiological point of view investigations were of no avail in regard to this case of ocular diphtheria. The parents had moved into a new lodging, obscure and damp, on February 18, 1895, and they do not know whether there had previously been a case of diphtheria in the house. The ocular trouble had commenced at the time they occupied their new domicile.

Conjunctival and Nasal Diphtheria ; Injection of 10 c. c. of Serum ; Recovery.

Case. IV.—Bri——, Emile, ten months old, was brought to Dr. Parinaud's clinic on March 23, 1895. The child had been suffering for fifteen days ; it had had coryza and bronchitis, and had not left its room during that period.

On March 15 the mother had noticed that the child kept the right eye half closed ; she had noticed no secretion nor lachrymation, but her information lacked precision.

On March 18 the condition of the eye was worse, and the left eye was attacked. The lids were not much swollen, and the child still opened them.

On March 22, on waking, the lids were œdematous, and the child could no longer open them.

The mother at last decided to consult a physician, and on March 23 I saw the patient for the first time.

The child was well developed, and aside from a few variole cicatrices, showed no traces of former disease, either hereditary or acquired.

The eyes were hidden by the swollen lids, which formed large œdematous pads on both sides. The border only of the lids was slightly injected. The lids, however, were supple and easily everted. There was no purulent secretion, and no flow of tears on the outer surface of the lids. The tarsal conjunctiva and the cul-de-sacs were uniformly covered with a gray false membrane, slightly adherent to the subjacent mucous membrane, from which it was separated with very slight bleeding. The bulbar conjunctiva was slightly chemotic, but the corneæ were intact. The pre-auricular and sub-maxillary ganglia were a little increased in size.

There was an abundant muco-purulent discharge from the nostrils, and a white pseudo-membranous exudate was found on the pituitary membrane. No disturbance was found in the pharnyx. The mother had noticed that during the last few days the child had been restless and feverish.

I was not able to obtain any precise etiological information.

The parents lived in a house occupied by a number of working people, but there was no diphtheria among them.

On the same day an injection of 10 c.c. of Roux's serum was made in the side. The sister of the patient, two years old, was given an injection of 5 c. c. as a precautionary measure. For local treatment, a boracic acid solution was prescribed.

March 22.—The patient was calmer during the night, and sleep had *not been interrupted.* On waking, the swelling of the lids had considerably diminished, and the child opened the eyes. The conjunctival false membranes were thinner, and easily removed by simple rubbing.

March 25.—The œdema of the lids had completely disappeared. The tarsal conjunctiva was still slightly injected. In the cul-de-sacs only was still a very thin pseudo-membranous exudate.

March 26.—The conjunctivæ and the pituitary membrane were perfectly clean, but there was still an abundant muco-purulent discharge from the nostrils.

March 28.—The conjunctivæ were quite normal in appearance. There were no cicatrices.

Bacteriological Examination.—On March 23 microscopical examination of the false membrane showed the presence of encapsulated diplococci in large numbers, and of bacilli of various irregular sizes scattered between the leucocytes.

Bacilli and diplococci were colored with Gram's stain.

Three serum cultures produced in twenty-four hours many colonies of diphtheritic bacilli. No other species of microbes were developed.

A gelatine culture produced in twenty-four hours numerous small translucent colonies composed of diplococci and chain cocci surrounded by a distinct capsule. Beside the colonies there were also small colonies of diphtheritic bacilli and three white colonies formed of a large coccus. Injection of the diplococci in a mouse killed it in forty-eight hours. Its blood contained encapsulated diplococci, which in beef-tea and gelatine cultures produced colonies with all the characteristics of pneumococci.

The diphtheritic bacilli, transferred to beef-tea, produced a slight cloud and a granular deposit.

One centimetre of this culture injected under the skin of a guinea-pig 400 grammes in weight killed it in six days.

Examination of fresh specimens, as in the cultures, showed the simultaneous presence of diphtheritic bacilli and pneumococci in the pseudo-membranous exudate.

On March 25 a second microscopic examination of the secretion did not reveal the presence of diphtheritic bacilli. A serum culture, after twenty-four hours in the oven, only produced two diphtheritic colonies.

On March 27 a tube of serum was fertilized with a platinum wire which had been drawn through the conjunctival cul-de-sac. In twenty-four hours no diphtheritic colony appeared.

A serum culture of the conjunctival mucus of the child's mother, made on March 23, produced no development of diphtheritic colonies.

Passing over the interesting clinical, etiological, and bacteriological points presented by these four cases let us consider the therapeutics.

In three cases injection of the serum caused rapid and complete recovery. The disease was not followed by corneal disturbances. This is in perfect accord with the five cases already published (1).

I have shown at the commencement of this memoir that diphtheritic conjunctivitis is very frequently benign. The objection might, therefore, be made that recovery in these cases was not due to the injection of serum, and that the disease might as well have recovered spontaneously. It is evident that I can make no such presumption; but the rapidity of recovery and the changes in the local and general condition following the injection so closely, show conclusively the therapeutic activity of the serum. From the facility with which the lesions were followed, these cases of ocular diphtheria furnish the best demonstrations.

Consider cases II. and IV.: From the day after the injection the lids, which had been firmly closed, were opened, and the adherent false membranes were easily detached with the slightest touch without causing the subjacent mucous membrane to bleed. On the next day, the conjunctiva was still injected, but the pseudo-membranous exudates had almost entirely disappeared. On the fourth day recovery was complete. The dose injected had been 10 c. c.

This quantity may be insufficient, as is shown by my third case. It is true that in this case the ocular diphtheria was complicated with nasal diphtheria. The first injection of 10 c. c. produced an improvement on the first day, followed by a relapse; but a second injection was sufficient to cause the disappearance of the false membranes in forty-eight hours.

The dose injected in the first patient was very large. The child had diphtheritic conjunctivitis, rhinitis, and laryngitis complicating measles; it must not be forgotten that this case was treated at the beginning of sero-therapeutics (February, 1894), and that at that time the therapeutic action of serum was not yet established. It was also for this reason that cauterization with $\frac{1}{40}$ collyrium was prescribed. The diphtheritic conjunctivitis disappeared in three days.

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(1) Coppez. (*Annales d'Oculistique*, November, 1894, and January, 1895.)

D. Desseaux. (*Normandie Medicale*, January, 1895.)

Jessop: Communication to the Ophthalmological Society of London, session of *January 31.* (*Annales d'Oculistique*, February, 1895.)

In cases where the diphtheria is localized on the conjunctiva an injection of 10 c. c. seems to be sufficient, but if the false membranes extend to the pituitary membrane and the pharynx, it will be better to increase the injection to 20 c. c. This injection is best made under the skin of the abdomen. As for local treatment, lotions of hot water or boracic acid are sufficient.

The last three patients remained with their families during the whole period of the disease; I injected 5 c. c. of serum in their brothers or sisters, as a preventive measure. They suffered no disturbances of any kind from the injections.

What course should the physician pursue in the presence of a case of pseudo-membranous conjunctivitis ?

I think that in the absence of a bacteriological examination he may in all cases, and without danger, make an injection of serum. But that is not sufficient if the case is doubtful—if, besides the pseudo-membranous exudation, there is a more or less abundant purulent secretion. It should not be forgotten that certain cases of acute conjunctivitis may, especially during the first days, be mistaken for diphtheritic conjunctivitis. The fear of nitrate of silver (in collyrium) in ocular diphtheria has certainly had more harmful consequences than its use in this disease could ever have produced. I have seen cases of gonorrhœal conjunctivitis where there was a pseudo-membranous exudation which was mistaken for ocular diphtheria, which latter did not exist. Cauterization with nitrate of silver was carefully avoided, but this prudence was none the less followed by extensive lesions of the cornea.

I recently observed at Dr. Parinaud's clinic a case of acute contagious conjunctivitis in a child. A superficial false membrane had developed on only one side, which was not adherent to the tarsal conjunctiva. Cauterizations with nitrate of silver $\frac{1}{40}$ were prescribed without considering the false membrane otherwise than for bacteriological examination. Complete recovery followed in a few days, and the false membrane disappeared in the same time. Bacteriological examination showed, however, that besides the bacillus of Wecks, there was a virulent diphtheritic bacillus. During the period of treatment, the mother took the disease, but she had an acute contagious conjunctivitis of moderate intensity without diphtheritic complications. In the house inhabited by these patients there had been, six months before, a case of laryngo-pharyngeal diphtheria. Here is then a case of ocular diphtheria confirmed by bacteriological examination, in which cauterization with collyrium of nitrate of silver produced (or at least did not prevent) a rapid recovery.

It will also be seen in the first case in this article that collyrium of nitrate of silver did not change the action of the anti-diphtheritic serum.

I think that in case of doubt, if there are false membranes and a purulent secretion, and if the diagnosis of ocular diphtheria is not firmly established, it will be well, after making an injection of serum, to cauterize with collyrium of nitrate of silver. If there is no secretion, or if it consists only in flow of tears, and if from the history, or rather from bacteriological examination, a diagnosis of ocular diphtheria is made, injection of serum without other local treatment is enough to bring about recovery.

CLINICAL STUDY ON ARTIFICIAL EYES

By Dr. **PANSIER** (of Avignon).

Introduction and Extraction of the Artificial Eye.

Before introducing an artificial eye the orbit should be cleansed with a solution of boracic acid. The first few times it would be well to instil, as a preparation, a few drops of cocaine.

The eye should be moistened before being introduced into the orbit.

In the case of a right eye, the eye is held between the thumb and index finger of the right hand. With the thumb of the left hand the upper lid is lifted and the large extremity of the eye is introduced, allowing it to slide along the cheek and lower lid. The eye is pushed upward and inward in a way which lets it slide between the stump and the lid. Little by little it is brought to a horizontal position. The upper lid is then allowed to drop, and the eye is held in place by the thumb and index finger of the left hand. With a finger of the right hand the lower lid is drawn down in such a way as to make an ectropion, the eye is carefully forced into the orbit and supported by the fingers which hold it, so that it becomes lodged in the lower cul-de-sac. The lower lid is then released, which, on recovering its position, holds the eye in place.

For the left side, the artificial eye is held in the left hand and the upper eyelid is lifted with the right.

If the patient himself performs this manipulation he uses the left hand where we have indicated the right.

To remove the eye, the lower lid is drawn forcibly downward, making a complete ectropion.

The patient is made to look up, and the eye falls into the hand ready to receive it.

If there is no stump, or if for any other cause this process does not succeed, the head of a pin may be introduced under the lower edge, near the internal angle. The pin is carried from inward outward, and generally, before it reaches the middle of the lid the eye slides out of the orbit.

Rittérich points out a third method by which large and more rebellious eyes are removed. A small hook (for example, a hairpin bent at the curved end) is introduced under the lower edge of the eye from inward outward toward the middle. While a slight traction is made on the eye, the upper lid is pressed toward the external angle with the thumb, and toward the internal angle with the index. In this way the lid, pressed against the orbit, prevents the eye from sliding, while the hook draws it toward the interior angle, or it is held between the thumb and index finger.

A process which is frequently employed by the patient is as follows: the lower lid is drawn down, the thumb-nail is inserted between the lower edge of the eye and the conjunctiva, and the eye is taken between the thumb-nail and the end of the index finger.

Another method consists in drawing the lid downward, then pressing upon it in such a way that it passes under the lower border of the eye, which then slides spontaneously out of the orbit. This procedure is only practicable when the eye is not very prominent.

It is never well to employ forceps for removing an artificial eye. For example, if one attempts to grasp an eye with forceps he must press them so tightly as to incur the risk of breaking the eye.

For children who wear an artificial eye for the first time, Boissonneau has suggested making a hole in the lower border of the eye, through which a thread is passed. This thread lies on the cheek and serves to remove the eye.

This process seems to me little to be recommended; the thread on the cheek would be annoying, and would expose the child to the temptation of removing the eye too frequently from the orbit. I know that Rittérich, to overcome this difficulty, recommends that the thread be fastened to the cheek by a small plaster. This method would, I believe, be scarcely accepted.

Before giving an artificial eye to a patient the practitioner should assure himself that the patient understands putting it in, and especially the taking it out. It is frequently tiresome to give this instruction, but it is indispensable. However, I have never found much difficulty in teaching this manœuvre to my patients, even when they happened to be children. These latter learn this exercise with such rapidity that they abuse their talent at the risk and peril of the artificial eye.

In the beginning the patient should be recommended to wear the eye only during certain hours, in order to gradually accustom the orbit.

Rittérich considers this restriction unnecessary: "A well-made and well-fitting eye causes no pain or inconvenience, and may be worn a half-day or more."

This may be in the majority of cases; but I think it better to leave a large latitude to the patient, after being assured that the stump is not sensitive to pressure.

It is generally said that the artificial eye should be removed at night, in order that the orbit may rest. I know patients who have worn artificial eyes during many years, and who never take them out day or night, except for a short time each morning, when the eye is polished and the orbit cleansed.

The eyes, under these conditions, of course, wear out much more rapidly. We are not warranted in prescribing the continued use of the artificial eye.

Excesses of this nature may prove to be the cause of sympathetic troubles: "I removed an artificial eye for a woman which she had allowed to remain in the orbit for three years, the optician having omitted to inform her that the eye should be removed from time to time. Lustreless, rugose, and covered on the posterior side with calcareous concretions, the eye had become the cause of inflammatory disorders." (Deval: *Traité des maladies des yeux*, p. 1036.)

The patient should be advised to remove the eye at least once a day, to polish it, and to cleanse the orbit either with clear water or a solution of boracic acid.

Durability of an Artificial Eye; When Should It Be Changed?

Enamel, like glass, undergoes a chemical change on contact with the air, especially moist air; also, in the orbit, under the action of tears, the mucus of the conjunctiva, and under the influence of the lids, the eyes rapidly lose their lustre, and become dull and roughened.

The method of putting the eye in a glass of tepid water and leaving it overnight is, therefore, a bad one, from the point of view of its preservation.

"Artificial eyes," says Rittérich, "last at least two years or more." When an artificial eye has become roughened it may be polished by rubbing it with a piece of linen coated with modelling wax impregnated with fine-powdered emery. "By this means," adds Rittérich, "I have known a man to wear the same eye for ten years, only taking the precaution to polish it as soon as the eye appeared to become roughened.''

The artificial eye should be changed, either because it does not fit the orbit, because the eye is badly made, or because it is worn out.

The most striking sign which indicates to us the necessity of changing the eye is the absence of mobility. If the movements of the eye compared to those of the stump are less extended, it is because the eye is too large or too small. If too large, it is compressed in the orbit by the eyelids and cannot follow the impulsion given by the stump; if too small, it becomes loosened from the stump, does not receive the movements from it, and may become spontaneously displaced from the orbit.

A fault still more grave is the loss of stability. The eye falls spontaneously, or comes out at the least movement.

The loss of stability may proceed from several causes: from a fault in the eye, or an anomaly in the orbit.

1st. From the eye itself. The eye is held in place by the eyelids, especially by the lower lid, against which it rests. If the eye is too bulky, the lower lid is pressed down, the cul-de-sac disappears, and nothing remains below to hold the eye, which is carried out of its proper position by the pressure of the upper lid. If the eye is too small and its upper conjunctiva too narrow, in its movements it rises into the upper cul-de-sac so far that its inferior border becomes disengaged from the lower cul-de-sac, and the eye escapes from the orbit.

2d. The fault in stability may proceed from the orbital cavity. A shrinking of the lower cul-de-sac or a conjunctival bridle prevents the eye from being held in its place.

A defective artificial eye may cause more or less violent pain. If it is too large, it takes possession of the entire orbit. If a single point bruises the conjunctiva, the pain will be localized at this point, and especially in movements which press the eye toward the seat of the pain.

On the other hand, the eye being too strongly convex, the pressure of the edge of the eye will be too strong upon the stump, and the latter will be wounded. The pain then becomes generalized and increases at every movement of the eye.

An opposite effect may follow if the eye is not sufficiently arched and the posterior face rests against the cornea or the cicatrix of the stump. The pain, localized at first in the stump, soon takes the form of insupportable headaches.

Pain appearing on the in and out movements of the eye indicates that the internal border bruises the lachrymal caruncle.

A lustreless and worn-out eye causes itching, and a feeling like sand in the eye; this pain may cause the most intense headache.

Dangers Arising from a Defective Artificial Eye.

If the artificial eye is an advantage, either from a functional point of view, in providing a more easy outlet for the tears, or from a cosmetic and æsthetic point of view, in hiding an unpleasant deformity, it demands some care and precaution on the part of the practitioner. That is to say, a well-made artificial eye is generally without danger, but a defective eye may lead to the gravest results. Especially in the country, in the absence of competent oculists, it is the pharmacists and opticians who have charge of artificial eyes, and who discharge this duty as well as their limited knowledge or their ignorance of the question allows—that is to say, generally as badly as possible. They choose from a collection more or less restricted an eye which they force, at a venture, into the orbit, without regard to size or the presence of cicatricial bridles. The fault of these eyes is nearly always that they are too large.

That is why, therefore, the artificial eye is frequently unable to entirely hide the loss of the organ.

In many cases of enucleation, notwithstanding the presence of the artificial eye, there exists under the eyebrow an unpleasant depression caused by the position of the lid. The elevator muscle is inserted into the tarsal cartilage by a layer situated between it and the orbicularis muscle (Schwalbe). The levator muscle then reflected upon the globe serves as a point of support which acts upon the lid. If the globe is absent, this point of support for the muscle is wanting, and the muscle then acts directly backward. This form of action brings about a marked falling in of the lid below the brow. The presence of the artificial eye, especially when the orbital borders are very prominent, does not fully correct this defect, and leaves a conspicuous hollow.

In order to remedy this, one is tempted to augment the size of the eye; indeed, the larger it is the less apparent is this depression. With very large eyes it is rendered but little noticeable, but at the price of serious mischief.

I have seen some striking examples which I think worth reporting.

A young woman came to me to have her eye, which was slightly roughened, changed. The lower lid of this eye was pulled down, forming a slight ectropion: the patient stated that the eye watered constantly. It was completely immovable. I removed it; it was very large, much larger than the globe for which it had been substituted, and instead of forming an elipsoïde, it constituted at least three-quarters of a complete sphere. I showed the patient that if she persisted in wearing so large an eye she exposed herself to grave dangers: the laxness of the lower lid was very marked, it could increase to a point where it would completely efface the cul-de-sac, and the eye would lose its stability. I advised her to rest several days without using the eye, in order to permit the lower lid to regain a little tone, and absolutely refused even to give her a smaller eye. She returned about one month later, having continued to wear the eye. For several days she had severe periorbital pain, especially during the day, and presented on the opposite side sympathetic ophthalmia. The removal of the eye stopped all pain, but for many months the patient could not endure even a small eye. The sympathetic visual troubles became rapidly better.

In another case, the patient, a robust peasant, abandoned the use of the artificial eye after a similar experience due to wearing too large an eye.

I would not have believed it possible to introduce into the orbit such large eyes. I have seen one which presented all movement of the lids. I was written to concerning this patient, who believed he had a tumor of the orbit, while in reality the pains were caused either by the exaggerated size of the eye or by the bad state in which it was found. Nevertheless, in this case the eye had been furnished by a Parisian manufacturer; in the two other cases they were obtained from a pharmacist and an optician.

I insist upon these details, desiring to impress the fact that an artificial eye is not beneath the consideration of the practitioner, and that it well merits his attention. If he does not provide it himself, he should at least examine it, and not permit the use of an eye until he has assured himself of its perfect adaptation.

Complications Which May Be Produced by an Artificial Eye.

Formerly, the artificial eye was accused of causing serious troubles in the well eye, such as "discharges, inflammations, cataracts, and amaurosis." These beliefs were so strong that Mauchart tells us that even in his time the surgeons dared not advise the use of one. To-day we are free from these prejudices, and the artificial eye is no longer accused of encouraging these formidable sympathetic troubles. Possibly this is so, in part, because to-day it is so much easier than formerly to procure an artificial eye well made and well adapted.

Nevertheless, the artificial eye in the orbit constitutes a foreign body, and may become the cause of irritation. Such irritation attains its maximum when the eye becomes rough and engenders, therefore, the painful phenomena of which we have written above. There may result from it a conjunctival inflammation and œdema such as to cause the eye to be pushed out of the orbit. In other cases the use of the eye may bring about an abundant suppuration.

The first thing to do is temporarily to remove the artificial eye, and not to return it until all inflammation shall have disappeared. Granulations should be excised or modified by touching with the crayon of nitrate of silver; the purulent discharge should be treated by antiseptic washes and by instillations of collyria of nitrate of silver and of sublimate.

In certain cases the stump maintains an exaggerated irritability, and cannot bear the contact of the artificial eye. Such ntolerance is especially observed when the stump is the final esult of a violent inflammatory process. Patience is then equired, and if, in spite of time, this sensibility does not disppear, it can be reduced by enucleation of the stump; but the sthetic advantages of the artificial eye are thereby diminished, nd its mobility is restricted.

The use of too large an eye sometimes results in effacing the nferior cul-de-sac and in compromising the stability of the eye. requently the removal of the eye during a longer or shorter ime permits the eyelid to regain its tonicity. A procedure hich has given me good results when the effacement of the ul-de-sac was very marked is as follows: two needles, carrying thread, are inserted into the most retracted portion of the culle-sac, 1 centimetre apart, and brought out below the cartilage, nd the loop thus formed is drawn in such a way as to form an ntropion. Preferably a silver thread should be employed, hich may be left in place during a considerable time, precauion being taken to tie it anew from time to time.

To remedy the forcing down of the upper lid in patients with rominent orbital margin, Critchett advised the following proedure: ligature with a silver thread above the lid, including cutaneous fold large enough to draw the lid up.

De Wecker prefers to use a sub-cutaneous loop, binding the rbicularis with the frontal muscle.

This inconvenience will be better overcome by giving the rtificial eye a special form.

Under such circumstances, an eye may be made with a slight rojection on the back which is supported on the stump while ts prominent upper border pushes back and maintains the upper id.

The ordinary form may also be used by lengthening and urning in the upper border of the cup so as to form a kind of rch which rests against the orbit, and on which the lid is relected. In this case the eye is supported on the stump only y its lower border.

It would be difficult for the practitioner himself to make such complicated models. The patient should be sent to an intelligent and skilful manufacturer. The latter will usually destroy five or six eyes before attaining the desired form. Unfortunately, such eyes will have little mobility.

Obstacles to the Use of an Artificial Eye; Operations Which May Become Necessary.

The obstacles to the use of an artificial eye may arise from the eyeball, the conjunctiva, or the lids.

(*a*). The only obstacle which may arise from the eyeball itself is its size. Whenever the eyeball is larger than normal, or the diminution in the size of the eyeball is not enough to permit of the introduction of an artificial eye, however small, a preliminary operation is necessary. Since the operation is done in view of the use of an artificial eye, the surgeon should take pains to leave a large stump: the operation which best fulfils these conditions is excision of the anterior hemisphere. Rittérich, in such cases, has withdrawn the greater part of the vitreous by a puncture, so as to induce the natural atrophy of the organ.

(*b*). On the part of the conjunctiva, there may be cicatricial bridles or a complete symblepharon.

It is sometimes sufficient to cut the bridles and immediately apply the artificial eye to prevent their reformation.

At other times they are made to disappear by simple dilation, by inserting larger and larger eyes.

A third procedure avoids this difficulty, and consists in making indentations in the artificial eye corresponding to the bridles, but the mobility is less in this case.

Symblepharon, adhesion of the two lids, is a more serious obstacle.

Rittérich advises separation of the two lids and the insertion of an artificial eye to prevent this reunion. This method is insufficient: during the first days the artificial is tolerated, although it is not firm in the absence of cul-de-sacs. But it is quickly driven from the orbit by the cicatricial process. A new attempt must then be made, only to see the same inconveniences repeated in a few days: patient and surgeon soon become weary.

Recourse may be had to conjunctival grafting.

Haltenhoff (1) has replaced the conjunctival mucous membrane with flaps from the skin of a frog. This method seems to give passable results, especially in complete symblepharon.

Wolfe (2) borrows the conjunctival mucous membrane from the eye of a rabbit. The patient and the rabbit are simultaneously chloroformed. When the adhesions of the lids have been separated, the portion of the rabbit's conjunctiva which is to be transplanted is outlined by an incision. Threads are passed through this flap, which serve to stretch the mucous membrane, which is detached with a few cuts of the scissors. Holding the flap stretched by the threads, it is quickly fitted to the freshened surface of the lid. It is well to have many sutures, to insure cohesion, and to place in the middle of the flap a looped suture which penetrates the lid. A true autoplasty may be performed by taking the mucous membrane from the patient himself: the labial or vaginal mucous membrane is then chosen.

These different methods, direct autoplasty or transplantation of animal mucous membrane, have one inconvenience: the result is not permanent. The transplanted mucous membrane proliferates, and the artificial eye is soon expelled.

Finally, an obstacle to the use of an artificial eye may arise from a deformity (ectropion, coloboma) or an absence of lids. In such cases recourse must be had to more or less extensive autoplasties the description of which is not within the scope of this article.

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(1) Haltenhoff: Conjunctival Transplantation. (*Rev. de la Suisse rom.*, 1875.)

(2) Wolfe: Transplantation of the Conjunctiva of a Rabbit to the Human Eye. (*The Lancet*, April 8, 1879.)

AMBLYOPIA AND ATROPHY FOLLOWING CARDIAC TRAUMATISM

By Dr. **VALUDE.**

The case is that of a vigorous man, a butcher, thirty-six years of age, who, early in October, 1894, was the victim of an accident from a carriage. Passing under a porte-cochère, he was forcibly pressed against the wall by the shaft of his cart. He *did not fall to the ground*, and his head was not in the least injured; there was merely violent pressure of the chest at the sternum and sixth, seventh, and eighth ribs of the left side, without wound and without fracture.

Dr. Roustan (of Creil), who saw the patient soon after the accident, thus describes his condition: "He was at once supported and carried to a bed, but for more than two hours was so pale and cold that he was thought to be dead. I saw him about four hours after the accident; the heart was scarcely beating, the pulse imperceptible, the patient cold and prostrated, although able to answer questions. Thanks to a few injections of ether and of caffeine, to the administration of quinine and of nux vomica, the heart resumed its action, but the pulse-rhythm was not re-established until the next day. It had been imperceptible for several hours, and then irregular. Meantime, the patient had spit a little blood."

The patient himself says that he was unconscious for several hours, and remained four days in bed. His chest was contused, and there was a slight sinking in of the lower false ribs of the left side.

As he emerged from syncope his thoughts and memory were confused. This cerebral disturbance gradually disappeared during the ensuing days, and his muscular strength returned.

At the same time he became conscious of visual disturbances, which were at first severe enough to prevent him from seeing and counting his fingers. On the eighth day he was able to get up, but was still unable to see. He was at that time in full possession of his faculties, and on the tenth or twelfth day after the accident his sight began to return. Improvement continued day by day, but so slowly, that on the 17th of October, about three weeks after his accident, the patient came to me for advice.

I found him in his usual condition of strength, active and vigorous of limb; his heart beat with regularity, his arteries were healthy.

The eyes were fixed, the pupils moderately dilated, with the aspect of amaurosis; the right eye was able to see and count fingers at 3 metres, the left eye at 50 centimetres. The ophthalmoscope showed the following conditions: The fundus of the eye was covered by a bluish-gray haze, more pronounced around the two maculæ, especially in the left eye, where the cloudiness formed a marked aureola around the macula; the macula itself was of a garnet-red color, hemorrhagic, in appearance like a flea-bite. The arteries were exceedingly small, slender, and apparently empty, but did not seem to be atrophied or whitish; the veins were not exactly tortuous, but seemed to be very full of black blood. The papilla itself was perfectly normal.

In fact, the ophthalmoscopic appearance was that, not of embolus, but of ischæmia of the retina, such as may be observed during certain extensive hemorrhages, or during the algid stage of cholera. It was an ischæmic condition of the arterial circulation of the retina.

Treatment consisted in the daily administration of trinitrine and inspirations of nitrite of amyl.

October 22.—No change in the visual condition. *November 7.*—Under the treatment, the acuteness of vision is apparently a little higher in the right eye, but both optic discs are of a whitish appearance, and the arteries have the same thinned aspect. Injections of antipyrine, which have given encouraging results in some cases of optic atrophy, are next resorted to.

November 20.—The papillæ are even whiter than before; the left one especially is quite atrophic.

On the right side the macula is normal; on the left, the macular region is occupied by a long reddish triangle, its base turned upward, which is the more easily seen because the peripheric œdema of the retina has disappeared. This œdema has left upon the surface of the reddish triangle of the macula some small spots of a dull white color, arranged circularly around the fovea centralis. Were they not so small, dull, and lustreless, these spots would resemble the constellation of albuminuria. They are like a fine powder, quite difficult to perceive at first, and exactly represent the macular lesion characteristic of retinal ischæmia. The left eye can see to count fingers at 1.50 metres, and the right eye at 2.50 metres.

The optic atrophy was already at an advanced stage, and appeared to be irremediable.

What was the pathogenesis of this case? Any previous pathological condition of the eye must be excluded. The man was the best shot of his regiment, and the possessor of perfect sight.

Was there direct lesion of the head? The physician who first saw him states positively that there was not the slightest contusion of the head, and that, moreover, he did not fall. Neither was there any hemorrhage from nose or ears, nor headache, nor any vomiting except on the first night of the accident, after the ingestion of medicine.

We are therefore obliged to return to the accident itself, which consisted of a violent pressure of the cardiac region, followed by prolonged syncope, and a veritable asystole of several hours' duration, necessitating the use of caffeine. It is, moreover, to be noted that the eye most affected by amblyopia, and showing the greatest number of lesions, is the left eye—the one under the influence of the left carotid artery. We know that central circulatory disorders of cardiac origin are chiefly felt upon the left side, or at least show their most marked effects there.

We have, in brief, found in this patient retinal circulatory disorders analogous to those met with in profound disturbances of the circulatory system (extensive loss of blood, algid stage of cholera), and these ocular symptoms were, in fact, caused by a serious disturbance of the circulation, since the heart had been so severely contused that syncope, which at first seemed likely to be fatal, had ensued, and was followed by a prolonged asystolic period.

That this reflex or synergistic contraction of the retinal vessels should in this case have been permanent, and have so rapidly ended in atrophy of the nerve trunk, is a remarkable and interesting fact, the more especially because the process is entirely ocular. The encephalic vessels would seem to have regained their vital power, for the patient had no headache, and his mental faculties and memory were completely restored.

I have thoroughly searched the literature upon the subject, and have found that these phenomena of ischæmia of the retina followed later by atrophy of the optic nerves occur as a result of severe syncope, but the syncope is always caused by abundant loss of blood or a grave general condition. I have met with no recorded case similar to this one, in which the vascular disturbance was due to traumatism of the cardiac region without loss of blood.

COMPLETE PARALYSIS OF THE LEFT MOTOR OCULI IN A CHILD OF FOUR YEARS—RECOVERY

By Dr. **De SPEVILLE.**

On the 18th of July, 1893, a child, P——, four years of age, was brought to me in consultation, because of complete closure of the left eye a few days previously. I found total paralysis of the motor oculi of the left side. There was complete ptosis. Upon lifting the eyelid, the eye was found to be entirely deviated outwardly as far as the external commissure, and perfectly immovable. Movements of elevation, depression, and adduction were abolished. The pupil was dilated to its fullest extent. The fundus was normal; there was no exophthalmus. Owing to the tender age of the patient, it was difficult to ascertain whether there was diplopia. The child was lively, and did not seem to be suffering. In spite of the most careful examination, I was able to find no sign of hereditary syphilis.

Two years previously, the little patient had had measles, since which time his health had been excellent. Eight days previous to examination he became nervous and cross, and lost his appetite. The father stated that he had slight fever unaccompanied by headache; the result, twelve hours later, of this slight pyrexia was complete closure of the left eye.

Family history was negative. The parents were robust and healthy. The father declared that he had never contracted syphilis. His wife had never miscarried, but had lost two children a month after birth from excessive heat. They had no spots upon the body, nothing upon the lips or anus. Nine days ago the mother gave birth to a fourth child in sound health.

I prescribed daily friction on the forehead and left temple with Neapolitan ointment about the size of a pea; 20 centigrammes of potassium iodide daily, and every two days periorbital electrization with the continuous current. At the end of a month the cure was complete, and has remained so up to the present time (October 15, 1894). Treatment was continued fifteen days after the recovery.

This is an interesting case of complete acute paralysis of the motor oculi, occurring without appreciable cause, and with very rapid recovery.

The cases of ocular paralysis in childhood which have so far been published do not show the same appearance and course as this.

The most striking fact here is that the motor oculi was affected in its entirety (the branches of the extrinsic as well as of the intrinsic muscles). This has not occurred in the cases already published, as some of the muscles innervated by the third nerve have, either wholly or in part, retained their functional power.

This was the condition in a case of paralysis, apparently congenital, reported by Dr. Parinaud: "The action of the superior and inferior recti was *nil*, as well as that of the inferior oblique, to judge by the exaggerated action of its antagonist, the superior oblique. As to the internal rectus, it contracted normally for lateral adduction, but did not contract for convergence. The slightly dilated pupil did not react to accommodation, but reacted readily to light. The levator palpebræ was intact. Amblyopia, which was pronounced, did not allow me to determine the state of accommodation." (Paralysis of the Movement of the Convergence of the Eyes, Obs. VIII., in *Brain*, 1886.)

The same is the case in Samelsohn's report (Society of Heidelberg, 1888. Discussion of a paper by Al. de Græfe). The case was one of congenital paralysis with divergent strabismus of the left eye, with the following characteristics: "The left associated movements were preserved, the right associated movements were lost. Convergence was nevertheless possible, because the left internal rectus, which did not contract for lateral adduction, contracted for convergence. Another peculiarity consisted in the fact that both eyes could turn to the right individually, but not simultaneously.

The clinical aspect of these two cases of paralysis of the motor oculi differs entirely from that of my case. While in the patients of Drs. Parinaud and Samelsohn there was disassociation of the action of the internal recti for the movements of adduction and of convergence, in ours the nerve which was affected throughout its whole extent resembled classic paralysis of the motor oculi in the adult. Moreover, whereas the paralysis was of congenital origin in the two former cases, in this the cause was obscure. To what, indeed, can it be attributed? An exact answer it is difficult to make. Nothing was found in the patient which would throw any light upon the nature of the functional disorder of the nerve. His health at the time the paralysis occurred, and, indeed, ever since his attack of measles, has been excellent.

Could hereditary syphilis be responsible for the attack? The patient does not show, and never has shown, any of the symptoms of this disease. The father declares that he never had syphilis, the mother has never aborted, and with the sole exception of the death of two infants a month after birth there is no indication that could lead us to suppose syphilis to be a determining cause.

Is it not more likely that there was some infectious process of undetermined nature? Would not the nervousness, loss of appetite, and slight fever which preceded the ocular trouble, as well as the rapidity with which this occurred, sustain this theory?

The complete absence of diplopia is noteworthy; after eight days of treatment, the improvement being already marked, the right eyelid was decidedly raised, but the eye still showed great divergence; yet the child never appears to have seen double, and was in nowise incommoded by the divergence of the two visual lines.

II.—REPORTS OF SOCIETIES

OPHTHALMOLOGICAL SOCIETY OF PARIS

Session of April 2.

Palpebral Scleroderma.

Dr. Despagnet presented a young girl sixteen years old, without neurotic or other history, who for a year past had noticed the appearance and development at the free border of the upper lid of the left eye of a slightly elevated plaque, surrounded at first by a dark border, and from which the lashes had fallen away.

This might be either a vitiligo or scleroderma. Drs. Balzer, Hallopeau, and Brocq considered the lesion as of sclerodermal nature, of the sort described under the name of *morphea alba plana.*

Mercurial inunctions at the site of the lesion and electrical treatment seemed to have arrested the development of the disease.

Symmetrical Keratitis of Undetermined Nature.

Dr. Despagnet presented a man sixty years old, who for five years had been troubled with peculiar corneal lesions, which had not been influenced by any treatment. The patient had no antecedent history, no sign of unfavorable diathesis. Although his general appearance was somewhat cachectic, there was neither sugar nor albumen in the urine, no gout, and no rheumatism. The corneal disturbance was essentially characterized by a gray coloration of the periphery of the cornea. The corneal opacity was in contact with the limbus. There was not, as in gerontoxon, a transparent ring interposed. There were no superficial disturbances.

The disturbance was accompanied with peri-corneal injection, more or less distinct at certain periods, but never disappearing completely. There was also some photophobia and lachrymation. There seemed to be no participation of the iris or of the ciliary body in the process. The disturbance had developed symmetrically, while in the left eye the opaque corneal ring was more distinct, and only the centre of the cornea was still transparent.

He intended to limit the invading process by cauterization with the galvano-cautery, not outside of the lesion, but within it, toward the centre of the cornea.

Dr. Parent thought that this was a case of sclero-keratitis. This disease is more particularly met with in rheumatic and gouty subjects. General treatment with salicylate of soda; the alkalies and iodides should be employed. Cauterization from the side of the ciliary body rather than from any other point was indicated.

Dr. Valude had treated this patient for two years and a half. Prolonged general treatment and cauterization with the galvanocautery at the limbus were of no avail.

Retinal Ischemia; Optic Atrophy Following a Cardiac Traumatism.

DR. VALUDE.—(*See article in full in this number, p. 266.*)

Dr. Gorecki.—This case raises a medico-legal question. In traumatic retinal hemorrhages, should it be said that the hemorrhage is due directly to a traumatism not acting directly on the eyeball, or should it be said that the production of the hemorrhage requires a predisposition on the part of the subject? I have seen a localized retinal hemorrhage following a traumatism accompanied with syncope, in a colleague, who had recovered from a former slight attack of herpetic sclerosis. In this case there was evidently a predisposition.

Ocular Troubles of a Bicyclist.

DR. DUBOYS DE LAVIGERIE.—A professional rider, twenty-four years of age, was attacked with peculiar visual disturbances during a twenty-four-hour race made in very cold weather. About the eighteenth hour he noticed that his vision was disturbed, that he steered badly, and that he ran into the other machines. Dr. Duboys found a diffuse disturbance of both corneæ without superficial lesion. He prescribed warm lotions and rest. On the same evening the vision commenced to improve; on the next day the corneæ had regained their normal appearance and the vision had its usual acuity. This trouble, according to the author, was due to the cold.

Indeed, during the night of the race in question, from the 2d to the 3d of February, it was very cold, and the thermometer sunk to —10°-12°. It must be added that during the entire race there was a corps of forerunners (trainers) who broke the force of the wind behind them. They were followed by the racers, and, so to speak, each racer was protected by a forerunner mounted on a bicycle, or forerunners on a tandem. The current of air which was thus made was so violent that if a crumpled paper was placed on the track when the racers passed by the paper rolled along and was drawn after them for several metres.

Ocular Disturbances Following Influenza.

Dr. Galezowski related three cases of localized retinal hemorrhages in patients who had formerly had probable attacks of influenza. In these cases no other morbid influence could be given as cause. One of the patients was a youth of sixteen years ; the other two were past forty. Dr. Galezowski referred the retinal lesions to infectious cerebral disturbances caused by influenza, recently described by Dr. Cornil.

Dr. Despagnet.—Among the various disturbances which may be produced by influenza I will describe an interesting case : A patient, after his first attack of influenza, had a passing visual disturbance, for which he did not consult a specialist. After the second attack, the visual disturbances reappeared with greater intensity and persistence. There was in the left eye atrophy of the papilla with diffuse borders (neuritic atrophy), and in the right eye, signs of peri-neuritis. Subcutaneous injections of cyanide of mercury had brought about decided improvement, and the narrowed visual field was much enlarged.

Dr. Chevallereau.—To attribute retinal hemorrhages to influenza, more precision should be employed in the etiological research. I have seen many cases of herpetic keratitis which appeared to me of grip origin ; but the hemorrhages of the retina may only be a pathological coincidence.

Dr. Valude.—The ocular disturbances of influenza are generally characterized by infectious or suppurating regions of various parts of the eye or the orbit. I have seen a case of orbital cellulitis in the course of grip which was followed by complete atrophy of the optic nerve. The cases of Dr. Galezowski are unusual, and merit special attention.

Dr. Parinaud.—In epidemic diseases which attack many people, such as influenza, there is danger of attributing to the epidemic disease ocular disturbances which have no direct relation to it. Retro-bulbar neuritis is one of the troubles which may develop during or after influenza, but is not peculiar to it; it may complicate many infectious diseases. I have noticed this same retro-bulbar neuritis sixteen years ago in a case of erysipelas. I have also described it under the name of rheumatic neuritis; it may be caused by an abscess of the lid or of the throat, by coryza, etc.

It is of some consequence to know this in influenza in relation to the pathogenesis of the cerebral disturbances described by Professor Cornil. This retro-bulbar neuritis—that is to say, peripheral—may, indeed, complicate various cerebral disturbances, such as paralysis of the tongue, of the face, hemiplegia, and mental disturbances. It is curious that these cerebral disturbances generally develop after the ocular disturbances: it is after the eyes are better or have recovered that the other nervous symptoms develop. These cerebral disturbances, such as retro-bulbar neuritis, are relatively benign, and tend, naturally, to recovery.

The retro-bulbar neuritis of influenza is most frequently bilateral. When it is complicated with various cerebral distuabances, one is tempted to believe it a neuritis of intra-cranial origin of quite different character. The differential diagnosis is easy if the very typical characteristics of rheumatic neuritis are remembered, which are found in the neuritis of influenza, which, besides, is frequently due to cold.

Dr. Antonelli.—In regard to vascular lesions in grip affections of the fundus of the eye, I wish to say that in one case the retina showed traces of former hemorrhages, but it was remarkable that no vessels were seen, either on the papilla, which was quite white, or in a large part of the retinal field.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM

Session of March 14, 1895.

A Case of Bilateral Optic Atrophy, with Peculiarities in the Visual Field.

MR. OGILVIE described a case of a man fifty-seven years old, a moderate smoker, who had experienced a diminution in vision beginning in December, 1893. He had formerly had attacks of epilepsy, and was a descendant of a neurotic family.

The movements of the eyeball and the pupil reflex were normal. In October, 1894, there was:

OD. $V = \frac{1}{3}$.

OG. counts fingers at ten feet with peripheral vision.

There was mixed astigmatism in both eyes. There were floating opacities in the vitreous, a discoloration of the optic papillæ, and tortuosity of the retinal veins. There was a congenital posterior staphyloma in both eyes.

The right visual field was narrowed for colors and for white. The lower internal sector was lacking in the left eye, and the visual field was also narrowed, and there was complete inferior hemianopsia.

No sugar or albumen in the urine. No syphilis. No alcoholism.

The patellar reflex was exaggerated.

It seems, from a former consultation, that he had already had an attack of optic neuritis; this was, then, atrophy of the papilla following neuritis.

In February, 1895, the upper and lower quadrants of the right visual field were absent, and the appearance was that of a right latent hemianopsia.

The patient worked in a tobacco manufactory, but his disease did not seem to be related to his occupation, as there was no central scotoma, and he experienced no improvement on abandoning his occupation. This was probably a hybrid affection—that is, an atrophy of the optic nerve combined with a congenital condition called coloboma by Fuchs.

Mr. James Taylor said that lesions of the occipital lobe should not be thought of in this case.

Mr. Bronner asked if the patient had not been unconsciously poisoned by lead.

Continuation of a Case of "Filaria Loa."

MR. ARGYLL ROBERTSON gave the continuation of the case of *filaria loa* which he reported at the session of October 18, 1894. (See *Annales d'Oculistique*, November, 1894, p. 336.)

After removal of the parasite the patient experienced no trouble for six weeks.

On February 6 the parasite was again seen and felt.

Two days later a swelling appeared in the right temporal region.

On February 13 the worm was felt under the right upper lid. An incision was made, and after dissection a filamentous body was found, smaller than the ordinary filaria. Deeper in the tissues was a well-developed filaria.

The blood was carefully examined from time to time during these last six months, but it was impossible to find a trace of filaria, or its embryo. At times, the patient had swellings of the arm.

The origin of the filaria in this patient was impure water.

Swellings of the arm, it seems, are of frequent occurrence in the inhabitants of the neighboring isle of Calabar.

An Unknown Form of Iritis.

Mr. Bailey had frequently seen in syphilis a deferred iritis occurring about thirteen years after the period of invasion. This iritis is bilateral, and has the appearance of serous iritis with, frequently, participation of the ciliary muscle. There is little tendency to the formation of synechia, but rather to secondary glaucoma.

At the same time, the patient may evince other symptoms of syphilis, such as ozena, disseminated choroditis, etc.

Sometimes there is a similar iritis in cases of hereditary syphilis, generally at about the age of twenty-one years.

In certain cases, relatively rare, the iritis may assume a more serious form, and the pupil may be obstructed by a layer of gray lymph. Sometimes this variety is accompanied with intra-corneal deposits starting from the posterior surface of the cornea, and forming a triangular plaque without vessels.

Sometimes, but very rarely, the iritis may be gummatous with possibly peripheral anterior synechia, or adhesive, bringing about occlusion of the pupil with secondary glaucoma.

Sometimes a slight interstitial keratitis is followed some months later by a gummatous iritis, and, on the other hand, an iritis such as has been described, with obstruction of the pupil and triangular corneal deposits, is accompanied with disseminated opacities in the cornea.

The characteristic teeth of hereditary syphilis are very rarely met with in pure serous iritis, while they are quite frequent in the forms associated with interstitial keratitis.

Mr. Spencer Watson found nothing new in this communication. All oculists had occasion to see cases of hereditary interstitial keratitis followed by iritis.

A Case of Traumatic Cataract with an Intra-crystalline Foreign Body.

Mr. Spencer Watson described the case of a workman, twenty-nine years old, who after an ocular traumatism complained of loss of vision. He had not noticed that a foreign body had entered the eyeball. The patient came for consultation on June 22d, and he had noticed a diminution in vision since the month of November. The lens was not opaque in the lower internal quadrant, and a yellowish-*white foreign* body could there be seen. There was a cicatrix in the cornea. On January 6 discission was performed. Three days later a linear extraction was made, and the foreign body was removed at the same time. One year after the operation he could read Jaeger 4 with +18 D.

The nature of the foreign body was not determined.

ACADEMY OF MEDICINE

(PARIS)

Session of March 12.

Empyema of the Maxillary Sinus Complicated with Orbital Osteo-Periostitis, with Perforation of the Vault, Abscess of the Frontal Lobe, and Atrophy of the Optic Nerve.

Dr. Panas.—Many cases of amaurosis, of paralysis of the motor nerves of the eye and of the trigeminus, have passed unnoticed, or have been wrongly interpreted through ignorance of the pathology of the naso-frontal sinus.

A patient recently came under my care with a dental lesion on the right side (superior molar) and amaurosis on the same side. On ophthalmoscopic examination the fundus of the eye was healthy, but there was orbital plegmon. Trepanning of the maxillary sinus was followed by improvement. But soon the symptoms of meningitis appeared, and the patient died; the amaurosis remained up to the end.

The pus from the maxillary sinus contained the staphylococcus aureus; that at the base of the brain, contained only streptococci. There had been perforation of the floor of the orbit, then of the vault, and extension to the meninges. The optic nerve had been compromised by the periostitis; afterwards it was altered, and the changes extended from the optic fascia of the opposite side to the retina without affecting this. Finally, there was an abscess in the frontal lobe.

SOCIETY OF OPHTHALMOLOGY AND LARYNGOLOGY OF BORDEAUX

Session of November, 1894.

A Case of Tenonitis.

DR. PUECH.—(See *Annales d'Oculistique*, February, p. 159.)

Bacteriological Researches in a Lachrymal Tumor with Bacilli.

DR. MAYET.—In the month of March last a woman came to Dr. Lagrange's clinic with a lachrymal tumor. The tumor was punctured, and the pus was aseptically collected with a Pasteur pipette, to be cultivated in the usual manner.

The cultures, made in Petri boxes, produced two kinds of colonies.

Each of these colonies was formed by bacilli. The first was a bacillus from 4 to 5 μ long, somewhat rounded at the extremities; the other was 5 to 6 μ long, and was formed of zoöglia.

The first bacillus was not pathogenic, and produced no result on inoculation; the second, on inoculation, produced serious disturbances of infection.

The injection of one drop of the culture in the anterior chamber had produced in four days an intense panophthalmitis, with perforation of the sclera at the lower anterior portion.

Inoculation in the skin of a rabbit's ear produced an abscess.

Various cultures made with this pus showed the inoculated bacillus.

Lastly, injection of three-quarters of a cubic centimetre in the auricular vein of a rabbit of 600 grammes' weight killed it in less than twenty-four hours. Cultivation of the blood of the auricle produced anew the injected bacillus.

December Session.

Melano-sarcoma of the Lids.

DRS. FROMAGET and CABANNES.—The case was that of a man whose upper left lid, after a traumatism in June, 1890, had increased in size and was distended by a large infiltration of blood. Several weeks after, the skin resumed its normal color, and the patient then found in this lid a hard tumor the size of a walnut, somewhat longer horizontally, and projecting under the raised and deformed lid.

The bulbar conjunctiva showed a few melanotic spots. The tumor was removed in September, 1890, by Dr. Lagrange; the patient left as cured a short time after, but returned in a few months with a recurrence, including, this time, both lids.

The skin was not changed, nor was it adherent to the subjacent tumors; there were melanotic spots on the conjunctiva and the border of the lids.

Above the lower orbital furrow, through the unaltered skin, a projecting tumor could be seen, the size of a walnut, in the lower cul-de sac, independent of the *squelette palpébral*, but adherent to the conjunctiva, which presented a grayish pigmentation, with here and there disseminated melanotic spots.

The tumors were removed with the attached mucous membrane, but the skin was left.

Histological examination of the tumor from the lower lid showed that it was a fasciculated sarcoma; furthermore, scattered here and there were cells containing melanotic pigment; these cells were found localized in certain points, but were few in number. The greater part of the tumor did not contain them. This was not the case with the recurring tumor of the upper lid. This tumor was almost entirely composed of cells filled with melanotic pigment. However, at the point of implantation of the tumor was a pure fasciculated sarcoma, free from pigment. Several months after, the patient came to me again with a third recurrence.

Sub-conjunctival Serous Cyst.

DRS. PUECH and FROMAGET.—A woman who had formerly had tænia, but who had recovered from this trouble, had a cyst with transparent walls in the lower conjunctival cul-de-sac. This cyst was the size of a pigeon's egg.

As the patient refused to have it completely removed, it was punctured, and a portion of the pocket was excised. The serous liquid was examined, *en masse*, some time after extraction; it contained numerous white cells, some red blood cells, and epithelial cells.

The wall of the cyst was composed without of conjunctival tissue, which differed in no way from sub-conjunctival tissue, except in being a little denser.

Within were four or five layers of polygonal epithelial cells, quite large in size, and which were deeply stained with reagents.

According to the authors, this was a congenital dermoid cyst, resulting from an inclusion of the conjunctiva at that point.

MEDICAL SOCIETY OF BORDEAUX

Session of March 8.

A Case of Diphtheritic Ophthalmia Treated with Serum.

DR. LAGRANGE.—A child one month old was attacked in the right eye with a pseudo-membranous ophthalmia with thick and adherent exudate. Examination of the false membrane showed a pure diphtheritic process. There was a serous discharge from the conjunctiva.

An injection of 10 c. c. of Roux's serum was made, but in concurrence applications of lemon juice were made. A second injection brought about disintegration of the false membranes, and the ophthalmia terminated in a phase of suppurative reaction.

In a few days the process had terminated, and there remained only a harmless conjunctival catarrh without corneal lesions. The injections of serum were unaccompanied with general disturbance of any sort.

Later a peri-articular abscess with staphylococci formed, which seemed to have no relation to the treatment or the disease itself.

ANATOMICAL AND PHYSIOLOGICAL SOCIETY OF BORDEAUX

Session of February 18, 1895.

Imperforate Lachrymal Openings.

DR. LAFITE-DUPONT.—The case was that of a child who had from birth suffered from lachrymation. On examination there was found to be complete absence of lachrymal orifices in the left eye, and, in the other eye, only the superior lachrymal opening was present. This was evidently a congenital malformation, which seemed also to be hereditary.

The mother, indeed, had lachrymal openings, but she always had and still suffered from lachrymation. Her father, during his entire life, had been troubled with the same lachrymation.

The grandfather and the mother, then, had defective lachrymal canals, since they did not fulfil their functions. It must also be mentioned, as co-lateral proof, that a young brother of my patient had been operated upon by Dr. Lagrange for a cyst of the lachrymal sac. The development of this cyst was due to imperforate lachrymal openings of that eye. The other eye was normal.

In the child in question there was only the superior lachrymal opening in the right eye. The fact of its presence above and absence below seems to explain the development of the nasal canal. For, according to Born and Legal, the primary epithelial cord, origin of the lachrymal ducts, is directly continuous with the upper lid ; the upper canaliculus will be the first formed, while the lower canaliculus arises from the descent of a process from the upper canaliculus.

According to Ewetsky, on the other hand, the upper extremity of the epithelial cord first enlarges, and is then divided by a partition of connective tissue.

The facts of this case of malformation seem to favor the theory of Born and Legal.

MEDICAL SOCIETY OF BUDAPEST

Session of January 25.

Congenital and Symmetrical Ectopia of the Lens.

DR. WEISZ.—It is known that congenital ectopia of the lens arises from a partial lack of development of the zonula of Zinn. This arrest of development is commonly associated with a similar modification in the iris and the choroid. The author has seen two cases of this lesion which were symmetrical in both eyes.

The first of these cases was a young man fifteen years old, who had an internal subluxation of both lenses, without coloboma of the lens, and without lesions of the fundus of the eye. Vision was : OD. = $\frac{2}{36}$, with + 16 D. = $\frac{6}{36}$; OG. = $\frac{6}{36}$ (?), with + 18 D. = $\frac{6}{18}$. These are curious results. The visual acuity of both eyes with + 16 D. was $\frac{6}{18}$.

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The second case was that of a girl twenty-one years old, who not only had ectopia of the lens, but in addition had congenital aniridia. The lens was cataractous, immovable, and fixed above to the ciliary body. The fundus of the eye was normal. The patient counted fingers at 1 metre, and the vision was somewhat improved with glasses + 10 D. There was also horizontal oscillatory nystagmus.

Session of February 5.

Spasmodic Infantile Hemiplegia with Atrophy of the Optic Nerves.

DR. BRAUN.—A child ten years old had suffered with clonic spasms since the age of two years. The parents stated that at first these contractions were preceded by paralysis of the face and left arm. Later, when the child began to walk, it was noticed that there was paralysis of the left leg. After the paralysis came a period of chorea.

There was actually hemichorea and hemiathetosis, and the left arm and leg were paretic. The left side of the face was also paretic. The patellar reflex was exaggerated. Lastly, the optic nerves were both atrophied. The author thinks that there was an embolism of the sylvian artery, and asks what connection there could be between the atrophy of the optic nerves and this lesion.

MEDICO-SURGICAL SOCIETY OF BRABANT

Session of March 5.

Diphtheritic Conjunctivitis and Sero-therapeutics.

DR. LANTSHEERE reported the case of a child eighteen months old with conjunctivitis of the left eye having manifest clinical characteristics of diphtheria : lids hard and large ; skin smooth and dark-red ; conjunctiva thick, yellowish, shining, and hard ; grayish serous secretion ; no false membranes. The conjunctiva seemed to be hard as wood. After fifteen days, although the condition of the eyes was satisfactory, there were white plaques in the pharynx and false membranes in the nose. Respiration was difficult and painful; the general condition was bad; convulsions.

Three injections of anti-diphtheritic serum of 10 c. c. each brought about an improvement, first of the general condition, and then of the local disturbances in the pharynx, nose, and eyes.

In cultures and on repeated microscopic examination, only streptococci and cocci were found. Nevertheless, the injections of serum seem to have had a really beneficial effect. This case confirms the opinion of Landouzy, who has already noticed the curative effect of serum in tonsillitis with streptococci pure and simple.

III.—REVIEWS OF OPHTHALMOLOGICAL JOURNALS

Wiestnik Oftalmologii

Reviewed by Dr. MUTERMILCH.

January and February, 1894.

I.—Spontaneous Recurring Hemorrhages in the Vitreous and Development of Compact Connective Tissue in the Vitreous and in the Retina, by Dr. CHODINE. (*To appear.*)

II.—Adonidine as an Anæsthetic for the Eye,

by Dr. KATZAOUROFF.

From personal investigations, the author reaches the following conclusions:

1st. Contrary to the opinion of Rommel (*Græfe's Archiv*, XXXIV., 3, p. 96), who has never seen symptoms of irritation following instillations of adonidine in the human eye, the author holds that these are of constant occurrence.

2d. This remedy is frequently inefficient in cases where cocaine acts in a satisfactory manner.

3d. Anæsthesia caused by adonidine is very often unequal in the various regions of the anterior segment of the eye; the conjunctiva is the least anæsthetized; the greatest anæsthesia is found in the lower portion of the cornea.

For these reasons, the author is not in favor of the use of adonidine as an ocular anæsthetic.

III.—The Comparative Action of Sublimate, Bi-iodide of Mercury, and Sulphate of Copper in Trachoma,

by Dr. DEBAGORY-MOKRIEWITH.

The author's investigations lead him to the following conclusions:

1st. Bi-iodide of mercury should always be used instead of sublimate, as it is less irritating to the eye and has superior antiseptic properties.

2d. Under the action of sublimate and bi-iodide of mercury, absorption of the follicles, of the papillæ, as well as of the sarcomatous infiltrations, occurs more slowly than with sulphate of copper; these two preparations should only serve as auxiliary media in the treatment of trachoma with sulphate of copper.

3d. Sublimate cannot be considered as a specific against trachoma; it is rather to sulphate of copper that this property should be given.

IV.— A Case of Persistent Hyaloid Artery, by Dr. SCHER.

March and April.

I.—The Result of Operative Treatment in High Degrees of Myopia by Extraction of the Normal Lens, by Dr. SCHROEDER.

(See *Annales d'Oculistique,* May, 1894.)

II.—Excavations of the Optic Nerve, by Dr. GARNIER.

The author has undertaken a series of anatomical and clinical researches for the purpose of explaining the formation of excavations, which, in the opinion of Schoen, are due to the contractions of the ciliary muscle in the act of accommodation. The author has found physiological excavations in 26% of the pupils of the schools of Odessa (2,594 eyes). The relation of these excavations to refraction is expressed by the following proportion:

Exc. M: Exc. H: Exc. E = 30: 26: 24. Garnier explains the formation of excavations by distension of the posterior segment of the eye, causing in its turn changes in the form and disposition of the fibres of the lamina cribrosa; he says there is no relation of cause and effect between the efforts of accommodation on the one hand and the formation of excavations on the other, as Schoen states. In defence of his opinion, Garnier says that the majority of excavations are seen in myopic eyes; then follow hypermetropic eyes, and lastly emmetropic.

III.—A Case of Gomma of the Sclera, by Dr. TARNAVSKI.

IV.—An Account of the Eye Diseases Treated in a Private Clinic (1892 to 1893), by Dr. Orlovski.

V.—Forceps for Turning Out and Fixation of the Superior Cul-de-Sac, by Dr. Reich.

May and June.

I.—Spontaneous Recurring Hemorrhages in the Vitreous and Development of Compact Connective Tissue in the Vitreous and in the Retina, by Dr. Chodine.

The author reports the case of a man twenty-nine years old who had typical spontaneous recurring hemorrhages in the vitreous of the right eye and development of compact connective tissue in the retina and vitreous of the left eye. From his personal observations and a series of cases reported by other authors, Dr. Chodine states that the cause of these hemorrhages is an anomaly in the walls of the blood vessels. The coexistence of frequent spontaneous attacks of epistaxis with these hemorrhages is further proof of this theory. As sequellæ of such hemorrhages, opacities of the vitreous, detachment of the retina, glaucoma, etc., have been observed, as well as development of compact connective tissue in the retina and in the vitreous. It was this development of connective tissue which was found in the author's case.

II.—Diffusion Circles and the Stenopœic Opening, by Dr. Katz.

In endeavoring to find if a stenopœic opening produces a sharp image in all degrees of ametropia, the author made a series of experiments which led him to the following conclusions :

1st. In all cases of ametropia a stenopœic opening produces a decided correction in vision; when the ametropia is slight (1 D.) complete visual acuity is obtained ($\frac{20}{20}$).

2d. Given the visual acuity obtained by the use of a stenopœic opening 1 millimetre in diameter, and the size of the orifice, given the maximum visual acuity, given the relation between the maximum visual acuity and the visual acuity obtained by a 1 millimetre opening, the degree of ametropia may be found, and amblyopia may be distinguished from ametropia.

3d. When very small stenopœic openings are used (0.1 — 0.4 millimetres) the visual acuity is invariable, whatever the degree of ametropia.

III.—On the Relation of Certain Cerebral Spinal Nerves to the Circulation in the Membrana Nictitans of "Ranæ Esculentæ," by Dr. Sergieff.

IV.—Lactic Acid in the Treatment of Corneal Ulcers,
by Dr. DOLGENKOFF.

The author cauterizes serpiginous ulcers and annular ulcers of the cornea with a 50% solution of lactic acid, and obtains very satisfactory results. The white scar which is produced after the cauterizations disappears in three or four days. The success of this treatment is quite remarkable in cases where there is photophobia with considerable injection of the peri-corneal vessels. In certain cases a single cauterization with lactic acid is enough to arrest the progress of the disease.

V.—A Rare Case of Deep Physiological Excavation,
by Dr. DOLGANOFF.

VI.—An Account of 204 Cases of Cataract Extraction,
by Dr. NICOLUKINE.

July and October.

I.—Diffusion in the Eyeball in Various Pathological Conditions, by Drs. BELLARMINOFF and DOLGANOFF.

The authors have made their investigations exclusively in adult rabbits with the colorimetric process (Bellarminoff); the following are their conclusions:

1st. Pathological conditions of the cornea of acute inflammatory character accompanied by morphological changes in the corneal tissue (abscess, infiltration, recent cicatrix, etc.), increase the diffusion through this membrane.

2d. The degree of diffusion is in direct relation with the extent and depth of corneal tissue invaded by the acute pathological process.

3d. In cases of operative wounds of the cornea (section, iridectomy, extraction), the degree of diffusion depends on the condition of the cicatricial tissue uniting the borders of the wound. When the cicatrices are recent, diffusion is greater. Definitely organized cicatrices cause no change in diffusion different from that of the normal condition.

4th. Permanent changes in the corneal membrane (cicatricial degeneration) diminish diffusion. The degree of diminution is in relation to the extent of surface which has undergone cicatricial degeneration.

5th. In operative wounds of the cornea where cicatrization is accompanied with an inflammatory process (suppuration, infiltraion) diffusion is increased in proportion to the intensity of the complication.

6th. Coloboma of the iris (artificial) does not influence penetration of fluids into the anterior chamber or into the vitreous.

7th. Increase of intra-ocular tension, even though slight in amount, is accompanied with a diminution of diffusion; this explains the slight effect of myoptics in the acute forms of glaucoma.

8th. The influence of temperature on diffusion has not as yet been sufficiently studied. The increase of diffusion from the influence of warm water applied to the eye is explained by changes in the superficial layer of corneal epithelium.

9th. Fluoresceine, acting on the eye for twenty minutes, does not reach the vitreous either in the normal or the pathological eye if the ens is preserved; but where the lens is lacking, the diffusion current reaches the vitreous.

10th. The lens tissue, combined with two layers of capsule, the ntact zonula, and the hyaloid membrane, present a strong obstacle o the penetration of fluids from the anterior chamber into the viteous.

II.—**Should Capsulotomy Be Performed in Cataract Extraction?** by Dr. Volkoff.

The author operates without iridectomy and without capsulotomy. The section, entirely corneal, passes a little above the border of the non-dilated pupil, or rather a little lower in the upper third of the pupillary region. The lens is extracted by compression, as in the ordinary operation, but as the capsule is complete, pressure should be more prolonged and greater. In 303 operations spontaneous rupure of the capsule occurred 48 times, particularly in young subects; there was prolapse of the vitreous 96 times (31.7 per cent); in 02 cases the operation was followed by complications (simple traumatic iritis, irido-cyclitis, etc.); suppuration of the cornea and panopthalmitis occurred 8 times; in 72 cases there were adhesions stablished between the iris and the borders of the corneal wound; wice abundant hemorrhages occurred.

From the result obtained, the author concludes that capsulotomy s superfluous (!).

II.—**Traumatic Corneal Astigmatism Following Extraction of the Lens,** by Dr. Dolganoff.

The author has investigated 20 cases operated upon by the von Græfe method, with the aid of the Javal-Schioetz ophthalmometer; the patients were examined both before and after operation. The first post-operative examination was made from nine till fifteen days after the operation; the last, when the astigmatism had become stationary.

The degree of post-operative astigmatism varied at the first examination between 2 D. and 8 D., and diminished progressively to about half the amount found at the first examination. The degree of astigmatism was less influenced by flattening of the cornea in a sense perpendicular to the direction of the section than by increase of its convexity parallel to the section.

The astigmatism in complicated wounds was considerably greater than the usual traumatic astigmatism. In cases of normal progress, retraction of the corneal cicatrix continues for from one and a half to two months, and it is only after this lapse of time that the traumatic astigmatism becomes stationary. The author considers that traumatic astigmatism is the result of the combined action of permanent tonic contraction of the eye muscles on the one hand, and the intra-ocular tension on the other.

IV.—**Trachoma among the Foreign Population of the Village of Staryj-Slavkine,** by Dr. KouchEFF.

V.—**A Case of Amaurosis Due to a Gumma at the Base of the Brain,** by Mme. Serebrennikoff.

November and December.

I.—**The Pathological Anatomy of Congenital Leucomas of the Cornea,** by Dr. Teplachine.

The author has examined microscopically the eyes of the newborn at term, affected with congenital leucoma of the cornea. He formulates the results as follows:

Congenital leucomas of the cornea in both eyes of a child are of inflammatory origin, and result from intra-uterine pathological changes in the cornea; they are accompanied with inflammatory lesions of other portions of the eye. In one case a corneal leucoma of the right eye was due to diffuse interstitial keratitis, that of the left eye to corneal changes described under the name: Keratitis von der hinteren Hornhautwand ausgehend (Fuchs). The lesions of inflammatory character found in the cornea of the right eye and in other portions of both eyes were attributed to hereditary syphilis.

II.—**Amblyopia Due to Anopsia,** by Dr. Segal.

The author says that amblyopia caused by anopsia cannot develop until there is complete suppression of access of light to the eye.

III.—Coloboma of the Optic Nerve, by Dr. Tarnovski.

IV.—A Case of Spontaneous Recovery of Detachment of the Retina, by Dr. Gurfinkel.

The American Journal of Ophthalmology.

Reviewed by Dr. Sulzer.

August, 1894.

I.—A Case of Unilateral Facial and Orbital Œdema and Exophthalmus of Nephritic Origin, by Dr. L. R. Culbertson.

A patient twenty-two years old had an enormous œdema of the lids of the left eye, which extended from the median line of the nose to the ear and downward to the upper teeth. Under the ophthalmoscope the papilla was seen to be light, the veins large, and the arteries contracted. Examination of the urine with picric acid revealed the presence of sugar. The author concludes that the existence of the orbital and facial œdema was due to a passing attack of acute nephritis in a diabetic and syphilitic patient.

September.

I.—Lid Pressure as a Cause of Astigmatism, by Dr. Howe.

Painters are in the habit of pressing the lids strongly together in looking at a canvas placed a few yards distant, to obtain, in this way, the effect of distance. The pressure of the lids on the cornea during this act of clinching produces a certain degree of astigmatism. Can this astigmatism become permanent? Roosa has found in 200 normal eyes an average astigmatism of 0.67 D. Among 33 artists, the average found by the author is 0.905 D. The element of time in the production of astigmatism by lid pressure is an important one. I am quite sure that those who have been accustomed to pinch the lids together for a considerable number of years have almost without exception produced an irregularity in the form of the cornea.

II.—**Albuminuric Retinitis,** by Dr. Hobby.

Two cases without peculiarities.

October.

I.—**A Case of Quadrisectorial Homonymous Hemianopsia,** by Dr. Weymann.

A man became paralytic after an apoplectic attack, preceded by severe headaches. Large doses of iodide of potassium improved the paralytic symptoms, but had no influence on vision, which was reduced to $\frac{20}{40}$ on both sides. With the perimeter two symmetrical disposed scotomata were found in both eyes. In the left eye they included the upper external and the lower internal sectors, in the right eye the upper internal and the lower external sectors.

II.—**A Case of Neuro-paralytic Keratitis from Injury to the Temporal Bone,** by Dr. Culbertson.

November.

I.—**A Case of Gumma of the Sclerotic,** by Dr. J. J. Kyle.

The appearance of a small scleral gumma, situated quite near the corneal limbus above, had been preceded by a gummous iritis.

II.—**Present Status of Asthenopia,** by Dr. F. Buller.

While recognizing errors of refraction as the most frequent cause of asthenopia, the author considers that disturbances of the external and internal recti muscles may frequently produce this condition. He does not agree with the opinion that disturbances of muscular equilibrium always disappear on correcting the errors of refraction which accompany them, and cites the existence in emmetropes of asthenopia characterized by muscular disturbances.

A separate group is composed of cases in which there is a decided weakness of accommodation. Reflex asthenopia should also be mentioned, and purely nervous asthenopia, frequently symptomatic of neurasthenia.

December.

Contains no original article.

IV.—BOOK NOTICES

BOOKS AND THESES

Recueil des cachets d'oculistes romains, by CAPTAIN EMILE ESPÉRANDIEU. (*Leroux, ed.* Paris.)

It has probably never happened to the *Annales d'Oculistique* to account to its readers for works published by captains in the French army. To-day we break away from our traditions and present a remarkable work, of which Captain Emile Espérandieu is the author. One of the most distinguished epigraphists of France, he has devoted his leisure hours to a study which is of interest to our readers, and has published a compilation of the seals of Roman oculists. It was in the *Annales* that Sichel, in 1866, published his *Nouveau recueil des pierres sigillaires d'oculistes,* and since then, at various times, articles relating to this question of medical history have found a place in the *Annales.* It is quite natural that Captain Espérandieu's work should here find the recognition which it deserves. Klein, in his enthusiasm, thinks that no antique relics are of such value as the seals of oculists; doubtless, he goes too far, yet one may judge of their value by the number and importance of writings on the subject. More than 200 publications have appeared on the subject of these little relics in the various countries of Europe. At the time when Sichel wrote his new compilation, scarcely 100 seals had been studied. Since then, the interest which they excited has only increased; none of them have been lost to science. Their list has continued to increase, and to-day almost 200 are known. There is an extensive literature relative to oculists' seals scattered through periodical publications, books, and pamphlets written in every language. Of these books and publications, some relate to the discovery of new seals; others have a more general character, and contain the history of all the signet stones known up to the time of their publication. But these have soon gone out of date, for many seals have been discovered since Sichel (1866), Grotefend (1867), Klein (1874), and Heron de Villefosse and Thédenat (1882) wrote their important works on the subject. All these publications, which at the time they appeared were properly supposed to be complete, are to-day behind the times, and the seals of Roman oculists awaited a new historian. Captain Emile Espérandieu did not shrink from the difficulties of this task, and he possessed, in truth, the knowledge necessary to accomplish it brilliantly. For two years past a series of studies on the seals of oculists from his pen have appeared in the *Revue archéologique de Paris.* He now combines these various fragments in one volume.

All known seals have a place in it; a special chapter is devoted to seals which have not been described until now; another to the flasks for collyria; finally, the author briefly describes the tablets on which oculists made their ointments and collyria. As is indicated by the title, the essential part of the work relates to the study of the seals. The author classes them in the alphabetical order of the places where they were discovered; he indicates in what locality they are now to be found, and in what museums the originals, models, or imprints may be found.

He gives the dimensions of each of them, and tells the substance from which it was made. A bibliographic notice of the articles published, describing them, is added. This new classification and the accompanying information is of a kind to make the studies and investigations of those who are interested in oculists' seals very easy. The inscriptions engraved on the surfaces of the seals are faithfully reproduced in their abbreviations, and then the completed inscription is given. The author enters into no discussion or interpretation of the text; he reproduces them exactly according to the version adopted by commentators, unless he sees fit to modify them from his own studies. The majority of these inscriptions have been verified from imprints or models, and frequently, also, from the originals. It is hardly necessary to mention the care and time spent in accomplishing such a work, which comprises the study of more than 200 signet stones scattered through a large number of museums of Europe, and the value which should be attached to this compilation, the details of which have been verified from the originals, or authentic reproductions, such as models, imprints, or photographs.

A chapter follows devoted to the study of the little flasks intended to contain collyria; I have a dozen of these, found at Athens, Catania, Cumes, in Egypt, in Hungary, Tarenta, Toul, and Saint-Remy. The number is quite insufficient to definitely trace their history.

Then follows an interesting chapter on the tablets which oculists employed to prepare their ointments and collyria. It would have been interesting to us if the author had given more attention to this *portion* of his work and had been less sparing of his erudition. But we cannot reproach him on this head. The title of his book promises us a compilation of Roman oculists' seals, and not of their tablets; hence, in adding the collyrium flasks and the tablets, the author has given more than he promised.

Captain Espérandieu then classes in alphabetical order all the collyria the names of which are known from the seals; with each collyrium is given the name of former authors who have described them, and in which of their works, the name of the place where the seal was found is given, and to which number of the compilation this seal corresponds.

Then in the same alphabetical order the names of all the Roman oculists are given, with the seals which relate to them, and the number in the compilation to which they correspond. We then read a series of names of Roman oculists who are known, not by seals, but by inscriptions, the locality of which is indicated, as well as the names of the authors who have written on this subject.

In the following chapter we find the names of the ocular diseases for which the collyria were applied; then the names of the towns where the seals were found, and their number in the compilation.

In the last chapter the seals are classified in the chronological order of their discovery, with the corresponding numbers in the collections of Tochon, Sichel, Grotefend, Klein, H. de Villefosse, and Thédenat, and that of the author.

Finally, the book closes with a complete list of all the works, and they are very numerous, published on oculists' seals, from Jean Smet (1678) to the present time.

Nothing so complete has been written on the subject of oculists' seals. Captain Espérandieu's book is the synthesis of all that has appeared on the subject; it is the conclusion of all the dissertations and discussions which have arisen concerning these relics, which recall a brilliant page of ophthalmology in the most flourishing days of the Roman Empire. This work is proof of the author's erudition, which was well known to us, but it appears in a more interesting form than that of similar writings preceding it. His conciseness, and the various classifications in alphabetical order of the localities where the seals were found, of the collyria, of the diseases for which they were used, and the names of the oculists, I am sure, will render investigations easy and rapid. The former bibliography is an interesting innovation in this kind of publication, but it must have necessitated long and careful research on the part of the author. Captain Espérandieu's book is not only a learned work, but is essentially practical, and will be of real service to those who are interested in the history of ophthalmology.—PROFESSOR DENEFFE.

Les ophtalmies du nouveau-né, by Dr. E. VALUDE.
(Paris, 1895, Rueff et Cie, publishers.)

This book appears in the Charcot-Debove medical library.

The author divides it into two parts. In the first, he describes ophthalmia of the new-born, purulent ophthalmia, catarrhal conjunctivitis, catarrhal conjunctivitis of premature children, conjunctivitis with false membranes, and ocular diphtheria; in the second part he describes the sequellæ of ophthalmia. Since bacteriology has in a large part removed the obscurity with which the pathogenesis of ophthalmia was surrounded ocular therapeutics has made a great advance.

The author, while giving the results of. his personal experience, reviews in a simple and clear fashion the contemporary researches on the various questions, and his great merit lies in producing an essentially practical book.

In the second chapter, devoted to the sequellæ of ophthalmia, he successively considers lesions of the cornea (opacities, complicated opacities, staphylomata, atrophy of the cornea and of the eyeball), lesions of the conjunctiva (retraction of the conjunctiva, symblepharon), lesions of the lids (entropion of the upper lid, entropion of the lower lid). Particular attention is given to therapeutics.—VAN DEN BERGH.

Traité pratique des maladies des yeux, by Dr. E. MEYER.
(4th edition, with 806 pages and 261 illus. *Masson, ed.*, 1895.)

The fourth edition of Dr. E. Meyer's practical treatise is about to appear. There is no occasion for reviewing this book, which is in the hands of all. It is enough to say that this edition contains an account of everything new which has recently been published in ophthalmology, and that by rejecting all which has become useless, as the author announces in his preface, he has found room for all that recent works have produced of practical utility or scientific interest.—VALUDE.

Embryogénie et anatomie comparée de l'angle de la chambre anterieure chez le poulet et chez l'homme (Comparative Embryology and Anatomy of the Angle of the Anterior Chamber in the Chicken and in Man), by Dr. GABRIELIDES.
(*Paris Thesis*, *Steinheil*, 1895.)

From the author's investigations, the following conclusions are *reached* :

The ligamentum pectinatum has its ontogenesis; it persists always in the chicken, while it disappears in man about the end of embryonic life; the place which it occupied remains empty, and forms part of the anterior chamber, forming the angle of this chamber.

The posterior wall of the canal Schlemm is continuous with the corneal endothelium in man and in the chicken.

The ciliary muscle of the chicken is formed of two parts, an anterior and a posterior. In man there is, as a rule, only one part corresponding to the posterior portion of that of the chicken. While in the chicken this posterior portion is inserted in the canal of Schlemm, in man the muscle is fixed to the summit of the angle of the anterior chamber.

The so-called Henle layer of the iris does not exist in the chicken in the sense that it is represented by the fine radiating and striated fibres of the dilator muscle. In man, the layer to which the majority of authors give this name is the dilator muscle of the pupil, which is single and corresponds to the preceding radiating fibres.—VALUDE.

MEDICAL JOURNALS

Treatment of Epilepsy by Tenotomy of the Ocular Muscles, by Dr. WOOD. (*New York Medical Jour.*, July 7 and 14, 1894.)

Heterophoria is met with in some form, latent or manifest, in more than 95% of individuals.

Alone, or associated with ametropia, it is a frequent cause of the clinical symptoms called asthenopia. Correction of the errors of refraction in the majority of cases causes the muscular symptoms to disappear. It is then pseudo-heterophoria.

In cases where the symptoms persist after optical correction, there is true heterophoria, which is the direct cause of asthenopia.

In cases in which epilepsy is to be attributed to lack of ocular equilibrium, other symptoms of the latter are not wanting.

Before interference with the muscles, refractive errors should be corrected and the results awaited.

It is true that some cases of epilepsy are cured by muscular treatment in cases where there is true heterophoria.

Anomalies of the muscles alone may indeed produce epilepsy by acting as a reflex irritant, on account of the great disturbance which lack of muscular equilibrium causes in the important function of binocular vision.

It is true, also, that cases of epilepsy have been cured by an operation on the eye muscles, although no ocular symptom could be given as immediate cause of the disease. These successes belong to the class of results obtained by operative suggestion. In the last century similar results were obtained by tracheotomy, setons, ligature of vertebral arteries, trepanning, oöphorrectomy, circumcision, castration, the actual cautery, resection of cicatrices, etc.

According to the author, when in a case of epilepsy there is manifest heterophoria which gives rise to the ocular symptoms known as eye-strain, it is proper to have recourse to a tenotomy, though it may be only a means of acting upon the imagination of the patient. In this connection the author recommends an inoffensive method advised by Reynolds, and which consists in removing, from time to time, a piece of skin from different regions of the patient's body.—VAN DEN BERGH.

Contribution to the Study of the Crossing of the Optic Fibres in Man, by Dr. HOSCH. (*Corresp. bl. für Schweizer Aerzte*, 1894.)

Dr. Hosch reports several new facts in favor of partial crossing.

In a woman who died at the age of seventy, the optic nerve of the right eye, which had been blind for four years, was found thinner than that of the other. A series of sections of the optic nerves and of the chiasm, prepared by the Weigert-Pal method, revealed the following facts: the right optic nerve was completely atrophied, and contained no nervous fibres; the left optic nerve was normal. Near the chiasm in the transverse section several nervous fibres were seen almost parallel to the direction of the sections situated at the lower border of the right optic nerve, while nearly all the fibres of the left optic nerve were cut transversely. In the chiasm the non-atrophied portion from the right side became larger and larger as the sections went backward. It was easy to prove that the normal fibres came from the left optic nerve. They were situated in the basal portion of the chiasm. In the posterior parts of the chiasm an atrophied bundle from the left side could be found situated in the basal portion. Its extent increased in proportion to the increase of the normal portion from the right side. From this exchange of fibres the left band was thinner at its origin than the right band, but it preserved the same quantity of normal fibres to its cerebral insertion. The proportion of normal fibres of the left optic nerve which passed into the right band was about two-thirds.

Dr. Hosch draws the following conclusions:

1st. Each optic nerve sends fibres to both bands.

2d. The crossed bundle is larger than the direct bundle.

3d. The direct fibres do not form a compact bundle in the bands. Immediately behind the chiasm there is situated in the median line, forming in transverse sections, a wedge-shaped figure. From there they traverse the crossed fibres to take their place on the lateral side of the band. The crossed bundle is situated on the median and basal side of the bands.

The same disposition of the optic nerve fibres was found in the second case. A girl who died of phthisis at the age of nineteen had lost the left eye when she was five years old.

The proportion and localization of the atrophied portions and of the normal portions were identical with the case described.

In a third case (a man who died at the age of thirty-seven, who had lost his right eye when he was twelve years old) Dr. Hosch used the Marchi method for staining. Serial sections again showed the same disposition of the crossed and direct fibres, but the differentiation was not so easy to make as with the Pal method.—SULZER.

Treatment of Detachment of the Retina, by DR. STEDMAN BULL. (*New York Med. Jour.*, Sept. 1 and 8, 1894.)

Conclusions based on 38 cases.

The former method of treatment—repose in bed in the dorsal position, atropine, a compressed bandage, and the proper medication to provoke reabsorption of the extravasated fluid—remains decidedly the best method of treatment.

The continued use of pilocarpine, by the mouth or in hypodermic injections, causes much prostration even in cases where this medication is well supported. Quite as good an effect, if there is any effect, is obtained by the use of bicarbonate of soda, or of iodide of potassium in very dilute solution.

In recent cases, sub-conjunctival scleral puncture produced momentary improvement, but it did not last.

If there are bands through the vitreous, puncture produces no result.

Division of these bands may stop the progress of the detachment. However, this should not be done when the bands are vascular, on account of the danger from hemorrhage.

Operative treatment should never be employed when the eye is in a condition of inflammatory irritation.

Scholer's method should be abandoned. In fact, passing improvement and frequently no result is all that follows therapeutic or operative intervention in detachment of the retina.—VAN DEN BERGH.

Convergent Strabismus, by Dr. VALK.

(*New York Med. Jour.*, November 24, 1894.)

In relation to treatment, the author distinguishes two classes of cases.

When one of the eyes is amblyopic from birth, parallelism of the visual lines is not stimulated by the need of simple vision, and the internal rectus, four times stronger than the external, draws the eye inward.

The condition of refraction is here secondary. These cases will be relieved by operation.

In the other category the author classes eyes which formerly had normal vision, but were hypermetropic where the deviation was due, according to the classical theory, to an exaggerated need of accommodation, which was only obtained by an exaggerated convergence.

Cases of this kind recover without operation by the simple correction of refractive errors.—VAN DEN BERGH.

Scopolamine, by Dr. HARVEY SMITH.

(*New York Med. Jour.*, July 21, 1894.)

In solutions of from $\frac{1}{5}$ to $\frac{1}{10}$%, toxic effects are easily produced, but they may be avoided by closing the lachrymal canal during the instillations.

Scopolamine has a therapeutic value equal to that of atropine.

Instilled drop by drop, it completely paralyzes the ciliary muscle and produces the maximum pupillary dilatation in twenty to thirty minutes. The effects last from five to eight days.

The superiority of scopolamine over other mydriatics rests in its rapid action.—VAN DEN BERGH.

Notes on 925 Cataract Extractions, by Dr. HIGGENS.

(*The Lancet*, August 11, 1894.)

In the last season the author has operated upon 74 cases, about half with and half without iridectomy. Iritis was less frequent in the operations without iridectomy than in the combined operations. There was one detail to be noticed : in cases where an iridectomy was made a thread was passed through a fold of the conjunctiva under the vertical diameter of the cornea. By means of this thread n the hands of an assistant the eyeball was easily held down during he manœuvres for the excision of the iris.—VAN DEN BERGH.

Syphiloma of the Optic Chiasm Producing Bilateral Temporal Hemianopsia, by Dr. C. E. NAMMACK. (*Med. Rec.*, February 9.)

William P——, thirty-four years old, came to the hospital on February 20, 1894, complaining of violent occipital headache, which had lasted for twenty days, and which had progressively increased in intensity.

He had never had rheumatism. In October, 1889, he had conracted a chancre which was diagnosed as syphilitic. He was subected to mercurial treatment. Six months later, P—— was found n a fainting condition in the bath-room, and remembered nothing hat had happened for forty days. At the end of that time he was paralyzed on the right side. At the end of three months he was able to leave his bed. He was then subjected to mixed treatment until December, 1893; at that time the treatment was stopped. Four weeks later, the headache for which he came to the hospital made its appearance.

On examination, the pupil possessed photo-motor and motor-motor eflexes. Vision was normal. The visual field showed the presence of bilateral temporal hemianopsia.

The diagnosis made was that of gomma of the optic chiasm.

The treatment prescribed was the internal use of iodide of potasium and mercurial inunctions.

The effects were very rapid, and on November 18, 1894, the hemianopsia had completely disappeared.

This case is very interesting, as the hemiplegia occurred six months fter the initial lesion, with energetic anti-syphilitic treatment. The ase is rare, and is similar to that of H. C. Woods, who describes a ase due to Schwartz, in which the hemiplegia made its appearance n the forty-sixth day after infection.—DE BOURGON.

Non-Cicatricial Ectropion with Treatment, by Dr. JOCQS. (*La Clinique opht.*, Jan., 1895.)

The author, in case of mucous ectropion, advises making four deep ertical incisions with the thermo-cautery, and also Snelling's suture. The lower end of the cauterizations extends to the cul-de-sac and oins the section made by the Snelling suture, so that the first and he latter form a continuous system, and the cicatrix produced by the Snelling suture will exercise traction on the lower extremity of the vertical cicatrices of the lid.—VALUDE.

Ichthyol as a Remedy for Several Ocular Affections, Principally for Ciliary Blepharitis, by Dr. F. RHO. (*Giorn. med. del R.° Esercito e della R.ª Marina*, n° 9, 1894.)

Before Dr. Rho advised it, ichthyol had never been used in ocular therapeutics. He has used sulpho-ichthyolate of ammonia with lanoline in the proportion of 15%. In all stages of ciliary blepharitis the action was very rapid and curative.

In collyrium of 1½ or 2%, with distilled and sterilized water as excipient, ichthyol has always been perfectly supported, and has given the best results in catarrhal conjunctivitis.

In three cases of phlyctenular conjunctivitis the use of this collyrium was most efficacious.—DE BOURGON.

V.—MISCELLANY

CORRESPONDENCE

NANTES, March 11.

MY DEAR COLLEAGUE :

You have had the happy idea of submitting to a sort of plebiscitum a series of questions of present moment. I wish to propose to you two questions of clinical observation which seem to me to have some interest.

The first is in reference to nystagmus. What becomes of nystagmus in old age ?

Here are my impressions on this point :

While it is of very rare occurrence, every specialist sees several cases each year, especially of the so-called horizontal form, and independent of any appreciable ocular lesion, contrary to the statements in the treatises.

There are three periods in life when recourse is had to the specialist for insufficient vision, without real disease of the eyes—the beginning of the school period, the age of conscription, and in old age.

In the first period the children are brought to us at the request of their school teacher, who thinks them myopic because they sweep their books with the nose.

If there is horizontal nystagmus, there is also noticed—the question of refraction being first determined, and generally there is only a hypermetropia common to the age found—a visual acuity invariably included between $\frac{1}{20}$ and $\frac{1}{5}$.

Convex glasses only magnify the image, and are frequently rejected.

At twenty years of age the number of cases of nystagmus is much less.

It is always supposed that there is objective integrity of the ocular apparatus.

Vision is generally somewhat superior, but I have never seen it exceed $\frac{2}{5}$.

Between forty-five and fifty I have only observed one case of horizontal nystagmus, and that was complicated with an independent lesion which rendered it impossible to determine the visual acuity.

What, then, has become of the cases of nystagmus in childhood and youth?

Do the muscular disturbances of the recti diminish as the patient grows older, like tics, until they disappear by a slow development of the centre of co-ordination, while at the same time the vision improves?

I have only seen a single example of rotatory nystagmus, much more rare, in an adult whose vision was normal.

What becomes of astigmatism in old age?

It seems to undergo an analogous modification.

It is extremely common in childhood and youth; I speak of the astigmatism which leads to asthenopia—that is to say, which exceeds 1.25 to 1.5 D.; thanks to the rapidity of determination with Javal's instrument, as many cylinders are now prescribed as convex or concave glasses.

But this frequency, from my personal experience, relates principally to cases of astigmatism of about 3 D. The light forms are much more common.

On the other hand, for how many old people do we prescribe cylinders? The number is extremely small.

It seems, then, that increasing rigidity of the eyeball as the years advance annuls the tendency to vertical flattening which is induced by pressure of the lids and the action of gravitation; astigmatism seems to disappear as the years advance.

Very cordially yours,

DIANOUX.

We have received, in connection with Dr. Pansier's article, the second part of which appears in this number (see above), the following letter from Dr. Gosetti (Venice), and insert the most important parts of it.

VENICE, April 2, 1895.

DEAR AND HONORED COLLEAGUE:—I have just read in the January number of *Annales d'Oculistique* a memoir by Dr. Pansier on the history of artificial eyes.

Passing over the very interesting facts which the author describes concerning the ocular prosthesis among the ancients, I stop at a passage in his article in which, after mentioning how for a long time Venice had the monopoly of the glass fabrication, and how for many years artificial eyes made in this city were in vogue, he quotes from Rittérich, who, in his work, which appeared in 1852, relates, *à propos* of the former renown of Venetian artificial eyes, how he tried to obtain directly some examples of Venetian manufacture: "The eyes that I have had sent from Venice," said he, "are of glass, and are for use only in wax-figures. However, one of my patients reported to me a successfully made copy, but he died suddenly before giving me the address of the manufacturer."

Dr. Pansier, after this quotation from Rittérich, mentions the works of Mauchart, Hazard-Mirault, and Desjardins *père et fils*, and coming to the present epoch, only mentions the work, more commercial than scientific, of Boissonneau. Not a word of the present manufactories of enamel eyes in Venice! I think that this slight is unmerited, and to vindicate perhaps a priority, and in any case a title of honor for an old family of Venetian glass workers, I beg, my dear colleague, to address these few lines to you.

Near the end of the eighteenth century, Louis Rubbi, one of a very old family of glass workers, had at Borbiago, a small village in the province of Venice, a manufactory of objects in glass. There, after many attempts, he succeeded in making an artificial eye in enamel, which he afterwards perfected, always keeping to himself the secret of its composition.

Before he died, he confided the secret to his nephew, Vincent Rubbi, who, in his turn, improved the process of manufacture of his uncle, and until the middle of our century was the only maker of artificial eyes in Venice and in all Italy. There is no doubt, then, that the eye bought in Venice by the patient of whom Dr. Rittérich speaks, and who died before giving the scientist the address of his manufacturer, came from the house of Vincent Rubbi.

Laurent Rubbi, the eldest son of Vincent, still further perfected the paternal industry, and to-day he makes really perfect artificial eyes, which will bear comparison with the best similar products from France and Germany.

At the International Ophthalmological Congress held at Milan in 1881 Mr. Rubbi exhibited a collection of artificial eyes which were much appreciated and received the highest praise from the oculists at the Congress. Some of the models of the eyes exhibited had on the borders special notches for adaptation to projections of conjunctival bridges which may exist in greater or less number in the orbit.

Yours etc.,

FRANÇOIS GOSETTI.

VI.—ITEMS.

Necrology.—Dr. Hulke, London.

ANNALES D'OCULISTIQUE

Volume CXIII.—Number 5.

MAY, 1895.

I.—ORIGINAL CONTRIBUTIONS

MEMOIRS

POSTERIOR SCLEROTOMY AND SCLERECTOMY IN GLAUCOMA

By Dr. **H. PARINAUD.**

In a communication to the Ophthalmological Society in 1885 I pointed out the utility of scleral punctures with a von Græfe knife in glaucoma, punctures which have received since the name of posterior sclerotomy.

In that article I stated that since 1830 paracenteses, either of the cornea or of the sclera, had been performed in glaucoma by Mackenzie and Midlemore (1); that Desmarres, who had also employed them to relieve the pain, had observed that sometimes the disease was arrested for a long time. I also stated that in 1876 Le Fort described to the Surgical Society two cases of glaucoma which had been cured by sclero-conjunctival paracentesis, but I doubt very much whether posterior sclerotomy, as it is practised to-day, would be called in France the operation of Le Fort, as Dr. Parent stated to our foreign colleagues at the Edinburgh Congress.

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(1) In an interesting monograph which Dr. Albert Terson has just published on Pellier de Quengsy I find that punctures of the cornea and of the sclera had already been performed by French oculists of the eighteenth century in hydropsy of the eye.

The operation which Le Fort twice performed consists in introducing a cataract needle obliquely into the sclera, so as to give exit to the fluid which this surgeon supposed existed between the sclera and the choroid. He said that glaucoma was produced by this effusion, and, with much assurance, states that oculists have been the victims of an illusion in believing in an excavation of the papilla in glaucoma. It is this pressing in of the choroid by the extravasated liquid which simulates excavation of the papilla. As a proof of the justice of his theoretical ideas, Le Fort describes two cases which were treated by this assumed evacuation of the sub-choroidal fluid. But, outside of the relief which may be obtained from any puncture whatever, it is not certain, from the symptoms described, that this was glaucoma, as Giraud-Teulon and Perrin have stated.

Thus, the operation of Le Fort consists in introducing a cataract needle obliquely into the sclera to penetrate between this membrane and the choroid. I do not think that in France or anywhere else this operation is now practised.

The recent article of Mr. Priestley-Smith at the Edinburgh Congress on posterior sclerotomy leads me to resume this question and to communicate the results of my experience.

I described the operation in 1885, in the following manner: "The operation may be performed without lid elevator and without fixation of the eyeball. A von Græfe knife is the only instrument necessary. The puncture is preferably made between the external and inferior recti muscles, eight or ten millimetres from the cornea. The eye being strongly turned upward and inward, the knife is plunged into the sclera, the point directed toward the centre of the eyeball, to a depth of from four to six millimetres. After leaving it a short time, I execute a quarter turn of the knife and draw it slowly out in slightly cutting the sclera perpendicularly to the first position of the blade, so as to obtain a triangular wound which favors persistence of filtration." (*Bulletin de la Société franç. d'opht.*, 1885, p. 279.)

For ten years I have performed posterior sclerotomy very many times in glaucoma with variable results. The principal cause of these differences rests, without doubt, in the individual peculiarities of the disease, peculiarities so numerous that it is very difficult to foresee how glaucoma will react under our knife whatever be the operation performed, for the distinction which has been attempted between malign and hemorrhagic glaucoma and benign non-hemorrhagic glaucoma, although it may rest on true clinical observation, is nevertheless artificial. Realizing the uncertainty of our foresight, we should nevertheless endeavor to find for each operation the technique which will give us the best results. Theoretical views have been of no avail up to the present time in deciding between the different operations directed against glaucoma; it is better to rely on pure and simple facts.

Having replaced in my instrument boxes the old von Græfe knife by the much narrower one recommended by de Wecker for cataract operation, I noticed that posterior sclerotomy gave less satisfactory results. I finally decided that a too narrow knife was not satisfactory. On the cadaver the scleral opening made by simple puncture by such a knife is found with difficulty, but the principal inconvenience is that the second part of the operation, which consists in making a section perpendicular to the first, is performed with less accuracy. A too narrow blade may glide through the wound without cutting the sclera. A knife should be employed about two millimetres broad.

If the scleral wound should be sufficiently large, it would be, on the other hand, a serious error to think that the final result is in relation to the extent of the wound and the quantity of vitreous evacuated. Large wounds of the sclera with abundant issue of vitreous expose the eye to inflammatory reactions, to exaggeration of tension after cicatrization of the wound, and sometimes to phthisis of the eye. Ophthalmotomy should be reserved for cases where atrophy of the eyeball is desired.

The principal factor in the success of posterior sclerotomy is the avoidance of all inflammatory reaction in the wound. I have become convinced that persistence of the opening made in the sclera may be obtained, cicatrization taking place in the conjunctival and episcleral tissue, without formation of cicatricial tissue in the sclera itself. I have arrived at this conclusion for three reasons : first, in two autopsies, in which, one month after in one case, and more than a year after in the other, I found the scleral wound not cicatrized, or at least capable of being re-established by a blunt probe; in the second place, by the establishment of a sub-conjunctival fistula, which is formed in some cases; finally, by what takes place in sclerectomy, of which I will presently speak, where the scleral opening, made in a certain manner, leaves the choroid visible at the bottom of the wound for a long time after the operation, and, as it seems, indefinitely. But this absence of cicatricial closure of the sclera is only obtained if all inflammatory reaction is avoided.

The following is observed immediately after the operation: the conjunctiva is ordinarily raised up by a small quantity of fluid. This swelling disappears the next day or the day after, the conjunctiva cicatrizes by first intention, and no further trace of the wound is found. In some cases the raising of the conjunctiva does not take place, there is no appearance of extravasation of fluid, and the traces of the operation are still less noticeable. In other patients, on the other hand, especially when the tension is very high and there is more or less abundant escape of the vitreous, there is formed on the days following the operation an inflammatory projection which might be considered as an ectasia of good augury. This is a mistake. These cases are the least favorable, doubtless because there is cicatricial obliteration of the scleral wound.

To avoid inflammatory reactions in the wound, ordinary antiseptic precautions should naturally be taken, in spite of the harmlessness of the operation itself, though I have never seen serious infection follow it. In the second place, one should endeavor to have a sub-conjunctival scleral wound. This result is generally obtained without special precautions, the conjunctiva elevated by the fluid cicatrizing rapidly by first intention. For greater surety the conjunctiva may be displaced by forceps before making the puncture, so that the conjunctival and scleral wounds do not coincide.

I have said that posterior sclerotomy sometimes produces a blind sub-conjunctival fistula. This fistula is established the more easily in proportion as the puncture is made further back nearer the equator. The formation of this fistula is not to be desired in cases where the vision should be preserved. It is, on the other hand, favorable in absolute glaucoma. In a case in which this fistula had persisted for almost a year, puncture of the projecting vesicle formed under the conjunctiva with a von Græfe knife was followed by phthisis of the eye, without inflammatory reaction. The fistula may be closed with a galvano-cautery.

I think that in ordinary cases the most suitable situation to perform posterior sclerotomy is eight or ten millimetres from the cornea, as I stated in my first article. Nearer the cornea, the episcleral tissue, a prolongation from the capsule, becomes more and more compact, and the raising of the conjunctiva by the fluid, which favors non-cicatricial closure of the wound, is produced with difficulty. Further back, a fistula is more likely to follow the puncture, and if the production of this fistula is desired the puncture should be made at the equator.

One of the advantages of posterior sclerotomy is, then, the possibility of obtaining a more or less persistent scleral opening without cicatricial coaptation, the closure of the wound being made solely by the episcleral tissue. The advantages of such a wound will be appreciated from the point of view of filtration. Nevertheless, this filtration does not take place as easily as might be supposed, and it should be remembered that in the majority of cases the diminution of tension produced by posterior sclerotomy is transitory. But it is just here that ocular massage, recommended by Dianoux in all operations for glaucoma, renders the greatest service. It should be performed by the surgeon from the day after the operation, if there is no manifest hypotonia, and from the third or fourth day in ordinary cases. These manoeuvres will teach the patient to perform massage himself, which should be repeated three or four times a day for several minutes. In this way the good effects of posterior sclerotomy may be increased to a considerable extent.

This operation is evidently not intended to replace iridectomy, which remains our greatest resource against glaucoma, but, performed according to the principles which I have stated, it may render us valuable service, and forms a new weapon against the affection, of which we will never have too many.

It is indicated in non-irritating glaucoma of slow progress, where the advantage of iridectomy is doubtful. Repeated at longer or shorter intervals, and seconded by the action of myotics, it seems to me the best treatment in certain forms of chronic glaucoma.

In acute glaucoma, it is of great advantage to perform first posterior sclerotomy, the immediate effects of which on vision are remarkable, and the operative risk practically nothing. In some cases the disease is arrested for a longer or shorter time. In others, where iridectomy would be indicated, sclerotomy still has its usefulness; it informs us of the degree of malignity of the glaucoma, and finally, it renders iridectomy easier, and even less dangerous, in cases where there is effacement of the anterior chamber and excessive hardness of the eye. It is this fact which has led Priestley-Smith to systematically associate it with iridectomy. However, I do not think that the practice of this surgeon in performing the two operations simultaneously is likely to be adopted. In acute glaucoma, the hypotonia which immediately follows the operation is sometimes very great, and may for that reason render the performance of iridectomy difficult.

When iridectomy has failed, posterior sclerotomy may still be useful, and it has this advantage that it may be repeated several times. In malignant glaucoma, where vision is immediately lost, sclerotomy should be performed far back near he equator, where there is more chance to have a fistulous conlition established, thanks to which enucleation may be avoided.

Finally, one of the principal advantages of posterior sclerotmy is its great simplicity. Even before the introduction of ocaine, I frequently performed it without assistance, without ixation of the eyeball, and with a von Græfe knife as my nly instrument. It can be performed by any physician who as once seen it, and for this reason it may render the greatst services in acute glaucoma until the patient can consult a ompetent oculist. Thus, Power has said that if he were atacked with glaucoma, and no experienced oculist were near im, he would ask to have posterior sclerotomy performed on im.

Sclerectomy.—This operation consists in removing a small ortion of sclera, about three or four millimetres in size, so as o obtain a cup-like excavation which reaches to the choroid or ear it. For this purpose, a fine chalazion hook is used, or etter still, a needle with the shaft slightly curved at its exremity and a von Græfe knife. The lids being separated by n assistant, or with a blepharostat, the needle is plunged into he superficial layers of the sclera, which are elevated, and ith the knife, the blade of which is parallel to the needle, a mall flap is cut from this membrane. At the bottom of the ound the choroid appears, which is laid bare or is covered ith a thin layer of scleral tissue, when the entire thickness of he sclera has not been cut. During the operation, or on the ollowing days, according to the case, the operation is comleted by plunging the point of the knife into the wound to ive exit to the intra-ocular fluid.

I had formerly thought of this operation for detachment of he retina. I described it in 1884, stating that I had also wice performed it in glaucoma (*Bulletin de la Société franç. Ophtal.*, 1884, p. 77). Two years after (*Ophthalmologial Society of the United Kingdom*, April, 1886), Spencer Waton performed an analogous operation under the name of treanation of the sclera, in which, however, he cut the choroid ith the sclera, which, in my opinion, should be avoided.

The aim of this operation, which I propose to call sclerectomy, is, it will be understood, to diminish the resistance of the sclera, to obtain a more efficacious filtration from the punctures, and, in certain cases, the formation of a staphyloma as a greater surety. To understand its utility, it should be stated that after the removal of the scleral flap closure of the wound may be obtained without cicatrization of the scleral opening, which is shown by the fact that a dark spot persists indefinitely at the bottom of the wound, which is the choroid seen through it. But to obtain this result certain precautions are necessary, and the principles which should guide us here are the same as for sclerotomy—that is to say, the least reaction possible should develop in the wound. This absence of inflammatory reaction and non-cicatrization of the sclera is easy to obtain in eyes with normal tension or slightly increased tension. It is more difficult to obtain in inflammatory glaucoma with high tension. It may, however, be realized by taking certain precautions which I shall describe.

Formerly, I excised the conjunctiva and the episcleral tissue with one cut of the scissors, in order to lay bare the sclera. This method is bad, because it is accompanied by too much inflammatory reaction. It is better to plunge the needle directly through the conjunctiva, and to remove with the same cut a small flap of conjunctiva and of sclera. The small opening made in the conjunctiva closes rapidly by first intention, and there is no tendency to the formation of cicatricial tissue in the sclera itself. For greater surety, one may, as in sclerotomy, displace the conjunctiva with forceps before using the needle, so that the conjunctival and scleral wounds do not correspond.

But this simple method can only be performed about seven or eight millimetres from the cornea. Further back the capsule is divided into several layers, contains cellular tissue in greater or less abundance, and the operation is no longer performed with surety unless the sclera is first laid bare; but instead of extensively denuding it, it is sufficient to make a meridianal longitudinal incision in the conjunctiva and the capsule, taking care to displace the conjunctiva with forceps before making the incision, so that the opening will not correspond with that of the scleral wound. Sclerectomy is very simply and easily performed at eight or ten millimetres from the cornea; it is, then, in this position that it should be practised, especially in glaucoma, where there is no indication to make it further back.

The other precautions to be taken are the following: the knife should not be plunged in too deeply, so as not to cut the choroid with the sclera. If this is done the inconvenience is not very serious, but with protrusion of the vitreous an inflammatory projection is almost invariably formed after the operation, and cicatricial tissue is formed in the wound. One should also endeavor not to cut through the entire thickness of the sclera; for this purpose the needle is only plunged into the superficial layers of the membrane. The cases where a thin layer of scleral tissue remains over the choroid are the most favorable.

Another question presents itself. Should the second portion of the operation, which consists in plunging the point of the knife through the bottom of the wound to give exit to the intra-ocular fluid, be performed immediately after the excision of the sclera, or on the following days? I ordinarily make the puncture during the operation, but in cases where the tension is excessive, to avoid abundant issue of the vitreous, and the inflammatory reaction which almost inevitably follows it, it is better, if the pains are not too severe, not to perform the puncture until three or four days after—that is to say, after cicatrization of the conjunctiva by first intention.

I have employed sclerotomy, especially in cases of malignant glaucoma, to avoid enucleation; but I think that it is also serviceable in chronic glaucoma of slow progress. When non-cicatrization of the sclera has been obtained the tension may be periodically diminished by punctures with a needle, which the patient, if necessary, may himself perform.

CLINICAL NOTES

ARTERIAL ANEURISM OF THE INTERNAL CAROTID AT THE LEFT CAVERNOUS SINUS; COMMUNICATION WITH THE RIGHT SPHENOIDAL SINUS; NASAL HEMORRHAGES; DEATH; AUTOPSY

By Dr. **GUIBERT,**
Late Interne of the Paris Hospitals.

In his thesis upon the intra-cranial hemorrhages of the internal carotid and its branches (1889), Dr. Gabriel Epron sums up what is known of the subject. Having had the opportunity of observing a very clear case of *arterial* aneurism of the internal carotid at the cavernous sinus, I have thought it a case worthy to be reported. It will be seen that the clinical symptomatology in nowise resembles that of arterio-venous aneurism, and that the diagnosis could only be established by the autopsy.

The 12th of last August I saw a young man who, in falling from a shock of sheaves upon a pitchfork, had lacerated his right eye. The prostration of the patient was far greater than is usual after such a lesion. The wounded man was brought on a mattress; he was pale, and seemed completely bewildered. Before even examining the injured eye, which was hidden under a bandage, the most striking thing was ptosis of the left eye. A careful examination showed that not only was the levator palpebræ paralyzed, but all the ocular muscles as well, without exception: ophthalmoplegia was complete. There was also mydriasis and paralysis of accommodation. Examination of the fundus revealed no lesion except a slight and indeed scarcely perceptible haze near the papilla. Arteries and veins were of normal calibre.

The right eye showed an extensive laceration of the sclerotic and of the cornea; the internal membranes, the choroid, and the iris, which were easily recognizable, were torn, and obstructed the wound. Sub-conjunctival infiltration had produced considerable chemosis in the inferior cul-de-sac. It being out of the question to preserve the eye, I decided upon enucleating it the next day.

The eighth day after operation the wound was completely healed; I ordered applications of the continuous current to the left eye, and gave two injections of strychnine on the temple upon two consecutive days, in order to hasten a cure of the left ophthalmoplegia.

The patient complained of heaviness in the head, and then of severe cephalalgia of the left side; abundant epistaxis followed. The attending physicians report that the blood gushed from both nostrils and from the mouth; the amount lost was collected and measured, and was over half a litre. It was of a bright red color. The patient became excessively pale, but as he was of a robust constitution, and taking plenty of nourishment, at the end of eight days there was no trace left of the hemorrhage. Nevertheless, from time to time he was subject to twinges of pain upon the left side of his head, the pains radiating to just behind the occiput, when suddenly, after a half-day of more than usually intense suffering, another hemorrhage almost as severe as the first occurred. The physicians noticed, during this attack, and the following ones, that the hemorrhage, at its onset and at its termination, came from the right nostril. It occurred so suddenly that its advent could not be foreseen; the stream was continuous, and about the size of a penholder; it stopped as suddenly as it began, so that the tampons and perchloride of iron, which have always since been applied, were only ready just as the hemorrhage was ceasing. The treatment then inaugurated consisted of daily injections of ergotine, the internal administration of the perchloride of iron, and tonics of every kind, to build up the patient's failing strength.

During the four months which intervened between the accident and his death he had ten hemorrhages, which so weakened and depressed him that he was unable to leave his bed. Three times he was overcome by syncope which simulated death but was of slight duration. During his last days he could scarcely manage to speak after the occurrence of a hemorrhage, and his pallor was cadaverous. On the following day he would have more animation, but a fresh hemorrhage would leave him in a weaker condition than the previous one.

At the end of a month the left eye, which up to that time had been completely paralyzed, began to make certain movements. At the end of three months motion was normal, ptosis having been the last to disappear. There was no mydriasis, vision was normal, and the fundus intact.

Auscultation of the right orbit by means of a stethoscope, which could be carried in deeply on account of enucleation having been performed, revealed nothing more than the usual normal souffle. It was the same with auscultation of the left eye and temple. In short, there was nothing to authorize a diagnosis of aneurism.

As to the patient himself, in addition to the agonizing headaches from which he suffered, especially on the day of the hemorrhages and the day preceding them, his temper was whimsical, discontented, and restless. For several days he complained of radiating pains in the upper jaw, and also of deeper pains in the occipital region.

Death occurred in the fourth month, after hemorrhages upon three consecutive days. Twenty-four hours later I conducted the autopsy. After having sawed through the skull-cap with great care, I raised the dura mater on each side of the superior longitudinal sinus. The falx cerebri was incised at its insertion into the crista-galli, and carefully lifting up the right frontal lobe, and then the temporal lobe of the same side, I confess that I was surprised to find no lesion. Proceeding in the same manner on the left side, I found near the cavernous sinus a pinkish tumor lying in a depression of the anterior portion of the second temporo-occipital convolution (a lobule of the hippocampus). This tumor appeared to be about as thick as the little finger; situated upon the left side of the sella turcica, it filled the cavernous groove, and it filled and projected above and outside of the cavernous sinus. In the vicinity of the cerebral depression where it was situated there was no trace of meningeal exudation.

By means of a vertical section passing through the occipital foramen, and a horizontal section at the centre of the face, I detached the anatomical specimen, which I wished to examine at my leisure. I then tore away the dura mater from the frontal eminences to the anterior clinoid processes, and carefully rasping the sella turcica, I found upon the left side, at the upper internal portion of the cavernous groove, an ovular splinter of bone which was extremely slender and adherent to the dura mater. It was 3 millimetres long by 2 broad. Close to its lower extremity was a second splinter, smaller, more irregular in shape, and pointed. Continuing to separate the dura mater from the pinkish tumor situated beneath, I found that the adhesion was greater upon the external surface; finally I was able to throw back the dura through the foramen ovale and the foramen magnum. The aneurism was by that means completely exposed, and seemed twice as large as before the dissection. It extended from the anterior clinoid process to the posterior clinoid process. Its loosely adherent anterior wall was easily lifted up from the subjacent bone ; not so the more adherent internal surface. Attempting to push it outward with the fingers, I was greatly surprised to find that I was pulling out a prolongation which extended into the sphenoidal sinus. This prolongation was only three millimetres long, and was terminated at its apex by an orifice the size of the head of a pin ; the edges were red, soaked, macerated, so to speak, in the blood. The orifice of the sphenoidal sinus which had admitted it was oval, and corresponded in shape very nearly to the splinter of bone found in the upper part of the aneurism, but was a trifle longer and broader.

From the posterior portion of this opening extended a line of fracture toward the sella turcica for a distance of about $\frac{3}{25}$ of an inch, from above upward and from without inward. The sphenoidal sinus, which was quite open to view, was full of clots which were continuous with clots in the right nostril and a portion of the right maxillary sinus.

I then made a section through the internal carotid as high as possible in the optic foramen, and as low as possible in the carotid canal. The tumor, when thus separated, seemed about the size of one's thumb. Its two extremities were formed by the normal calibre of the carotid, and on the internal surface was seen the prolongation with orifice already mentioned. Introducing the narrow blade of a pair of scissors into this orifice, I cut the internal wall of the aneurismal sac. It was almost wholly filled by clots which adhered closely to the external side, where they appeared as stratified masses, traversed by the yellowish-white lines of fibrin; on the internal side they were not adherent, and occurred as a reddish pulp mixed with gray. There was not the slightest sign of laceration near the cavernous sinus; in fact, the patient never showed any sign of arterio-venous aneurism, exophthalmus, pulsations, souffle, or thrill. The cavernous sinus was obliterated by the aneurismal dilatation of the internal carotid, which was lacerated upon its internal surface toward the sphenoidal sinus. The left wall of the latter was moreover excessively thin, and just below and behind the perforation, 3 or 4 millimetres from it, was a spot about the size of the head of a pin, which was transparent by artificial light. By means of a sound directed toward this spot, flexibility was noted—the slightest pressure would have caused a second perforation. It is a question whether this was a case of *wear*, such as occurs near aneurisms, or whether the left wall was congenitally weaker than the right.

The various aspects of the interior of the sphenoidal sinus, divided into two unequal portions by a median wall, sometimes thrown to one side and sometimes to the other, have been described. This case was a good illustration of such descriptions, for if a colored fluid were injected through the orifice on the left side of the sphenoidal sinus—the orifice which admitted the aneurismal prolongation—it regularly made its exit through the right nostril, which explains why the hemorrhage always occurred upon that side, in spite of the fact that the aneurism was situated upon the opposite side.

Conclusions.—Arterial aneurism of the internal carotid at the level of the cavernous sinus may result from fracture by contrecoup of the base of the skull.

The lesion of the right eye, in the case under discussion, simply confused the diagnosis; it was produced by the pitchfork which lay upon the ground near the spot where the young man fell. Arterial aneurism of the internal carotid in the cavernous sinus is especially manifested by the phenomena of ocular paralysis upon the side where it is situated, which correspond to the pressure exerted upon the external wall of the sinus. This paralysis, as we have seen, may be non-continuous.

The small size of the aneurism and its deep situation account for the absence of stethoscopic signs. As there was no compression of the optic nerve situated higher up, the ophthalmoscope revealed nothing like what is met with in cases of arterio-venous aneurism.

To the causation of *total ophthalmoplegia* as known so far should be added arterial aneurism of the interior carotid in the cavernous sinus.

It seems to me that the diagnosis can be positively established only by the autopsy; death is apparently produced by nasal hemorrhage following rupture of the aneurism in the sphenoidal sinus.

TRAUMATIC PROLAPSE OF THE ORBITAL LACHRYMAL GLAND (1)

By Dr. **G. HALTENHOFF.**

Traumatic lesions of the lachrymal gland are extremely rare. The majority of classical authors are silent on this point. Desmarres (2) knew of no authentic case of isolated injury of this organ, except in operations on the orbit, where it is not very rare, but of no importance. This injury may complicate wounds from firearms, as in the case of Larrey, where the gland was extracted with a fragment of a ball which had lodged in it.

The case of the small boy which I present here may, then, be of some interest.

Last winter, at the age of two and a half years, this child fell forward in a road full of broken stones. He got up with a bleeding face, and could no longer open his right eye. The country physician was immediately called, and found the eye swollen, impossible to open, and on the lid a wound from which a solid bloody mass protruded. He applied a regular bandage, and thinking the case serious, brought the child to me. I saw him three days after the accident. The child had not suffered, but had not been able to open the eye. I found the upper lid falling over, œdematous, tense, and quite ecchymotic. In its external third, several millimetres above the free border, there was a sort of fleshy protruberance of a livid grayish-red color, and of a consistency which seemed too firm for a simple clot. I admit that at first sight I was somewhat alarmed at the appearance of this tumor, which seemed to resemble a retinal-choroidal prolapse, as it is sometimes seen in injuries of the globe. It adhered by a sort of pedicle to the bottom of a horizontal wound of the skin. The little fellow resisted so vigorously that I etherized him, introduced a Desmarres elevator, and then opened the palpebral fissure enough to prove the perfect integrity of the eyeball. This was, then, evidently, a hernia of the lachrymal gland. The sharp edge of a broken stone, or possibly a fragment of glass or pottery, had cut the lid while it was open, penetrated obliquely from below upward through its suspensory ligament, which protects the orbital portion of the gland, and dislocated it through the wound. The round, somewhat oval, form of the tumor, its thickness of five or six millimetres in the centre, its diameter of about twelve to fifteen millimetres, and its compact consistency corresponded, in fact, to this organ.

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(1) Communication to the Medical Society of Geneva, Session of February 5, 1895, with presentation of the patient.

(2) DESMARRES: Traité théorique et pratique. *Paris*, 1854, Vol. I., p. 262.

It seemed difficult to me to reinstate the protruded gland in its proper position; still more so as, after three days' strangulation, there was possible risk of its becoming gangrenous or of suppurating. So I profited by the narcosis to cut it off from the lid. I then noticed at the bottom of the wound several grayish-red lumps, apparently lobules of the gland. They belonged, without doubt, to the palpebral portion, which, as is known, is formed of a mass of little isolated lobules with quite loose connections. The wound was united with two silk sutures, dressed with dermatol, and closed by first intention, except a punctiform fistula, which some time afterwards gave issue to a trace of fluid clear as water, but which did not prevent it from closing. The swelling of the region took several weeks to disappear. The recovery was perfect, and the cicatrix was scarcely noticeable. No difference is noticed in the appearance of the two eyes.

I will add that a vertical section made immediately after removal revealed a lobulated structure, showing in the central portion a grayish arborescent design, the ramifying prolongations of which were lost toward the periphery. The diagnosis of an acinus gland was further confirmed by microscopical examination performed by Dr. Buscarlet.

I have only found three similar cases described in literature. The first case, observed by von Græfe (1), was that of a child who cut the lid in its entire length underneath the orbital border, by falling on a piece of glass. The protruding gland, as large as a phalanx of the finger, hung over the lid. Severe ecchymosis of the conjunctiva was accompanied by exophthalmus—that is to say, with intra-orbital hemorrhage. Von Græfe thinks that pressure of the extravasated blood contributed to the expulsion of the gland. He sutured the lid above after the gland had been returned to its place. A portion of the wound suppurated, and recovery required five weeks.

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(1) *Archiv für Ophthalmol.*, XII., 2, 1866.

Twenty years after, Goldzieher (1) described a case quite similar to mine, of an injury from a piece of glass, and in which, as in my case, he performed ablation. A third case seems to have been noted by Panas in his lectures on the lachrymal apparatus (1887) (2).

Total or partial extirpation of the lachrymal glands, practised so frequently in late years to remedy incorrigible lachrymation, has proved that the integrity of this organ is not necessary to the eye. The cleaning of the cornea by the movements of the palpebral veils and the habitual lubrication of the ocular surface seem to be sufficiently assured by the secretion from the conjunctival glands, aided, perhaps, by a serous transudation from the entire mucous surface. Panas, furthermore, considers Krause's sub-conjunctival glands as forming part of the lachrymal apparatus. In my case, no difference is seen in the moistening of the two eyes. When the child weeps, both eyes weep alike. This fact may be brought forward in favor of de Wecker's theory, which is that emotional lachrymation proper to the human race is a function resting in the palpebral gland alone, which is lacking in the other mammals.

II.—REPORTS OF SOCIETIES

CONVENTIONS

FRENCH SOCIETY OF OPHTHALMOLOGY

Session held at Paris, May 6 to 9, 1895.

The Comparative Value of Objective Methods of Optometry.

Dr. Parent, *Reporter*.—Only a short time since, ocular refraction was determined in all the clinics of Paris almost exclusively by the subjective method of Donders. The assistants or chiefs of clinics charged with this duty made no previous objective examination, and having no information as to the refraction of the eye under examination, they passed before this eye an incredible number of spherical or cylindrical glasses. I trust that so unscientific a method has ceased to exist, and that every one has recognized the great utility of objective methods of optometry. I will describe the principal ones, commencing with those founded upon ophthalmoscopic examination:

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(1) *Pester medic. chirurg. Presse*, 1876.

(2) Panas : Traité des maladies des yeux, Vol. 2, p. 321.

1. Apparent displacement of the vessels with the erect or inverted image in relation to the movements of the observer.
2. Parallactic displacement of the inverted image in relation to the movement of the objective lens.
3. Variations in the size of the inverted image in spherical ametropia, and variations in the form of the image in astigmatic ametropia when the lens is moved away from the observed eye. Exact determination of the optometric remote point where the inverted image is situated.
4. The erect image.
5. Skiascopy.

APPARENT DISPLACEMENT OF THE VESSELS WITH THE ERECT OR INVERTED IMAGE IN RELATION TO THE MOVEMENTS OF THE OBSERVER. —For the emmetropic observer placed at a distance D from the observed eye, the H eye, the E eye, and also the M eye, whose remote point $R > D$ produces for the observer an erect and virtual image which, perhaps clear with H, will be somewhat indistinct with E (because the observer accommodates slightly) and more indistinct with weak myopia. There will be no image in M where $R = D$; this is *the neutral point of observation where the remote point of the observed eye is coincident with the pupillary plane of the observer.* Finally, there will be a real and inverted image in M where $R < D$.

On the other hand, in the case of an erect and virtual image, the apparent displacement of the vessels takes place in the same sense as that of the observer, and the contrary occurs with the real and inverted image.

It should not be forgotten that the amplitude of the apparent displacement of the image is in inverse ratio to the degree of ametropia (H or M). The greater the ametropia, the less is this amplitude.

Furthermore, it will be possible to determine the nature of the *ametropia.* But the difference in the size of the virtual images and the difference in amplitude for the same displacement of the observer does not permit of determination of the degree of hypermetropia. It can only be said that it is of small, medium, or high degree.

Another inconvenience of this method is that it necessitates a large pupil, in order that the vessels may be more easily seen, so that in the majority of cases recourse must be had to atropine or cocaine, which is inconvenient.

PARALLACTIC DISPLACEMENT OF THE INVERTED IMAGE IN RELATION TO THE MOVEMENT OF THE LENS.—In examining with the inverted image, if lateral movements are given to the lens at the time when the papilla is seen in the centre of lens, it will be noticed that the ophthalmoscopic image also moves. To facilitate this method of examination I would recommend tracing two cross lines on the lens with a diamond ; the centre or the border of the papilla may then be made to coincide with the centre of the cross. In this way the relative movements of the image and the lens may be easily observed. These movements vary in amplitude according to the condition of refraction of the eye observed.

Let us designate the ophthalmoscopic image by I, the principal focus of the lens by F, the displacement of the optical centre of the lens by D^l, and that of the image by D^i. We will then have :

E..	I in F............	$D^i = D^l$
M............	I inside of F............	$D^i < D^l$
H............	I outside of F............	$D^i > D^l$

If now there is unequal refraction in the different meridians of the eye (an astigmatic eye), and the lens is made to move in different directions, it will be seen, by means of the difference in the relative movements of the image and the lens, which of the two meridians is E, H, or M. If the two principal meridians have the same ametropia in different degrees, the increase or decrease of the displacement of the image in relation to that of the lens will be more pronounced in one than in the other. Very slight excursions of the lens are enough to show this difference.

It is especially in a case of mixed astigmatism that this method gives an interesting result. If the vertical meridian is M, and the horizontal H, it will be seen that the image moves slower than the lens in the vertical direction, while it moves faster than the lens in the horizontal direction.

After experimenting with this method I have become convinced that with it any astigmatism equal to or superior to 1 D. may be diagnosed. But for this purpose, if the astigmatism is compound hypermetropic or compound myopic, it is necessary first to correct one meridian by placing a lens in the trial frame. This meridian will be corrected when the image is displaced in the direction of the meridian as rapidly as thelens. It remains, then, to place in the trial frame a suitable cylinder which, in the perpendicular direction, will give to the image and the lens the same amplitude of displacement. Correcting glasses placed before the observed eye do not disturb examination with the inverted image.

This method is elegant, rapid, and quite exact. That it may be of practical use, it is necessary that the image should have a sufficient amplitude of displacement; a lens, then, of long focus must be used; for example, 12 D.

But with this method it is always to be feared that the observer will not hold his lens exactly perpendicular to the emergent rays, and will thus himself produce a certain amount of artificial or incidental astigmatism. This cause of error may be in part obviated by using lenses supplied with ball-and-socket joints, with which they are always vertical.

EXACT DETERMINATION OF THE REMOTE OPTOMETRIC POINT OR THE POSITION OF THE INVERTED IMAGE.—The objective lens placed before the observed eye gives it an artificial remote point, which we will call the ophthalmoscopic or optometric remote point. If F″ is the posterior focus of the lens, the ophthalmoscopic image of the observed eye will coincide with F″ (E), will be within it (M), or beyond it (H).

Whenever the observed eye acquires or loses an amount of refraction equal to 1 D. the ophthalmoscopic image is displaced by an amount equal to the square of the focus of the lens; it is displaced by this quantity beyond F″ if the observed eye is H, and by the same quantity within F″ if the observed eye is M.

In all ophthalmoscopic optometry with the inverted image, that it may be of practical value, the lenses should be without border and achromatic, and lenses of 14 and 20 D., on account of their short focus, should each be composed of four lenses, coupled two and two (flint and crown), each couple having a dioptric power of 7 and 10 D. This procures the double advantage of a large ophthalmoscopic field and purity of the image.

With a little practice this method permits a diagnosis of the different conditions of refraction to be made, and of all degrees of astigmatism superior to 2 D. But for this several conditions are necessary which are not always realized.

The first, and the most important, is that the pupil shall be sufficiently large.

Then, to appreciate more easily the variations of form, it is important to have a considerable enlargement, which can be obtained with a lens of 12 D. But then the field of observation diminishes, and for a slight departure from the special point where the focus of the lens coincides with the pupillary plane the image of the pupil will become rapidly smaller than that of the optic disc.

For these two reasons this method is only practical with pupils which are naturally large or which have been artificially dilated with atropine.

A third indispensable condition (if a fixed ophthalmoscope is not used) is that the lens should be held exactly perpendicular to the emergent rays from the observed eye, otherwise an artificial astigmatism will be produced which may increase or diminish that of the eye under examination. One is assured that the lens is perpendicular when the two reflections from the anterior and posterior surfaces coincide.

METHOD WITH THE ERECT IMAGE.—This method consists in finding the number of the lens which will give a clear image of the fundus of the eye to the observer, supposed to be E (or rendered so), and without accommodation. This lens, then, corrects the ametropia of the observed eye; it measures the degree of it for that special case.

There is always here a cause of error, which rests in the fact that the correcting glass is placed behind the mirror of the ophthalmoscope—that is to say, somewhat beyond the anterior focus of the eye. Its distance from the remote point will then be too small in myopia and too great in hypermetropia, and the same will be true of the focal length of the correcting glass.

This cause of error, which may be neglected for the low degrees of ametropia (1 to 4 D.), becomes important in the medium degrees (4 to 8 D.), and is very important in the high degrees (8 to 20 D.).

This source of error may be avoided by placing a lens (for example, + or − 5, 10, 15) in the trial frame, which in part corrects the high degree of ametropia and transforms it into a low degree, in which the error resulting from the non-coincidence of the correcting glass of the ophthalmoscope with the anterior focus of the observed eye may be neglected.

This method with the erect image, which I formerly recommended in publications which appeared in 1880 and 1881, is very easily acquired. It is the only optometric method with the erect image applicable to all cases.

The *diagnosis* of astigmatism with the erect image rests upon two principal factors: the form of the disc and the difference in sharpness of the vessels. Its *measure* consists in clearly seeing the entire contour of the papilla (whatever may be its anatomical form, oval or round) and in clearly distinguishing the double contour of all the vessels, whatever may be their direction.

The change in the form of the papilla is dependent upon a difference in enlargement, and will be more pronounced the greater the enlargement. It therefore happens that in like degrees of astigmatism the change in form will be more marked in myopic than in hypermetropic astigmatism, because in the first case the eye performs the function of a stronger lens than in the second.

But this deformation of the optic disc is not the principal point of diagnosis. It should, of course, be taken into consideration, but *the most important factor is the difference in distinctness of the vessels.* It is this especially which must be carefully considered in diagnosing low degrees and determining exactly the correcting glass.

This determination is relatively easy with my ophthalmoscope, which, in addition to convex and concave spherical lenses, contains cylinders with which all varieties and degrees of astigmatism may be measured.

Whether the principal meridians are right or oblique is indifferent, since the ophthalmoscope permits of placing the axis of the cylinders in any direction.

Rules to be Observed in Optometry with the Erect Image.—I will briefly enumerate them :

1. It is of great importance to hold the correcting glass in the ophthalmoscope as near as possible to the anterior focus of the observed eye. The error arising from their non-coincidence is such that high degrees of ametropia are no longer measurable by this method. They must first be partially neutralized with a + or — glass to transform the high degree of ametropia into a low one, not exceeding 3 or 4 D.

2. If, whatever be the refraction of the observed eye, the same field of illumination on the retina is desired in all cases, the inequality of the optical axis of ametropic eyes (H or M) requires a difference in the incident rays, and consequently the use of several mirrors. With this aim in view, I had an ophthalmoscope constructed in 1883 which contains three mirrors—one plane and two concave—of 20 and 8 centimetres focus. If the luminous source is at a distance of 20 centimetres from the reflector, the plane mirror gives

divergent rays, the concave mirror of 20 centimetres focus almost parallel rays, and that of 8 convergent rays.

3. The opening in the reflector should measure about 3 millim. Perforated mirrors of silvered glass are generally bad. When they are not bevelled they cause a troublesome reflex, and when bevelled the opening is too large, as the bevel is made at the expense of the silvered or reflecting surface. With steel mirrors it is just the opposite, and they are usually good.

Instead of a central circular opening, the fundus of the eye may also be seen through multiple openings in the form of small circles or parallel slits, like the optometers of Scheiner (1619), or of Young (1801). These mirrors utilize half of the emergent light (hence, better illumination of the image) and facilitate exact focusing on the small vessels in the fundus of the eye; in particular, those which are directed from the disc to the macula.

4. To avoid incident astigmatism (which increases with the dioptric strength of the spherical or cylindrical lens employed and with its obliquity) the correcting glass should always be held perfectly perpendicular to the axis of the emergent rays from the eye observed. Therefore, *the mirror should always be oblique in relation to the plane of the ophthalmoscope.* This obliquity may vary according to the position of the luminous source. I should fix the limits at 25° as minimum and 45° as maximum. It should not reach 56°, unless one wishes, as did Helmholtz, to utilize the angle of polarization by reflection to diminish the corneal reflex.

5. The ophthalmoscope should contain a complete series of spherical and cylindrical lenses, as far as possible, without combinations, for the lower and medium numbers. Those lenses should have a diameter somewhat larger than the average diameter of the pupil.

As a specimen of an ophthalmoscope for refraction, I will describe the instrument which I had constructed in 1889. It contains 30 spherical lenses by half dioptres up to + or — 5, then by dioptres up to + or — 10. Two other spherical lenses, + or — 10, give combinations with the preceding up to + or — 20. It contains also 11 concave and 11 convex cylinders with opposite axes. The plate which supports the 3 little mirrors (1 plane and 2 concave) is movable. When it is removed the ophthalmoscope may serve as a subjective optometer, since it contains almost all the spherical and cylindrical lenses of the trial case.

OPTOMETRY BY SKIASCOPY.—The principle is as follows: Suppose the observer to be at a distance of 1 metre from the patient and the lamp near the latter. After reflection on the concave mirror, a *portion of the rays* penetrate into the observed eye, and form on the quired. It is the only optometric method with the erect image applicable to all cases.

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OPTOMETRY BY SKIASCOPY.—The principle is as follows: Suppose the observer to be at a distance of 1 metre from the patient and the lamp near the latter. After reflection on the concave mirror, a *portion of the rays* penetrate into the observed eye, and form on the retina an image of the luminous source. This image will be sharp or diffuse according to whether the observed eye is or is not in focus for the catoptric image. Now, if the concave mirror is made to rotate, the image of the luminous source on the retina of the observed eye is displaced in a direction contrary to that of the mirror.

On the other hand, with a plane mirror the image of the lamp on the retina is displaced in the same direction as the mirror. Therefore, the phenomena found in Cuignet's method of examination will be opposite if, for the same eye, a concave and plain mirror are successively employed. For greater simplicity in what follows we will suppose that a plane mirror is employed.

Suppose, first, that the mirror is plane, the observer at a distance of 1 metre from the observed eye, and the movements of the ocular illumination (or of the shadow which limits it) opposite to those of the mirror. We are then dealing with a real and inverted image of the illuminated portion of the retina; there is then myopia greater than 1 dioptre. The degree of this myopia may be determined by placing stronger and stronger negative lenses before the eye, until the ocular illumination moves in the same direction as the mirror. The image of the fundus of the eye has then become virtual and erect, and the myopia is almost corrected.

Suppose now that the movement of the shadow is in the same direction as that of the plane mirror ; the image of the fundus of the eye is then virtual (H E or M less than 1 D.). To differentiate these three cases proceed as follows :

1. With + 0.50 the movement of the shadow becomes inverse; this shows that there was already M of at least 0.50.

2. With + 0.50 the movement of the shadow remains direct, but with + 1 D. it becomes inverse ; the eye was E, or almost so.

3. With + 1 D. the movement remains inverse ; H surely. Stronger and stronger convex glasses are then put before the eye until the movement becomes inverse. This lens diminished by 1 D. (or N — D) gives almost the degree of H.

In fact, the method consists in finding with what lens (N) the remote point of the observed eye is at about 1 metre. N expresses, then, the degree of M and N — 1 the degree of H.

Intensity of the Shadow and Amplitude of Its Apparent Displacement.—A peculiarity to be noticed on account of its practical importance is that the shadow (which limits the illuminated portion and follows it when it changes place with the movements of the mirror) is deeper and moves more slowly in the higher degrees of ametropia.

The first of these two characteristics is due to the fact that the image of the luminous source is more or less sharp or diffuse on the retina, according to the condition of refraction of the eye under examination. When the image is sharp, or nearly so, it partially illuminates the surrounding portions of the retina by reflection, and is only surrounded by a penumbra. The diffuse image, on the other hand, only slightly illuminates the adjacent portions of the retina, which are thus in a true shadow. The intensity of this shadow is proportionate to the diffusion of the image, and consequently to the degree of ametropia, if the mirror is plane—in fact, the reflector being at 1 metre, the luminous source is at 2 metres, and therefore the retinal image has its maximum sharpness at M of 0.50.

All this can be easily verified on examining with the erect image and with almost parallel rays an ametropic eye before which convex and concave glasses are successively placed.

As for the luminous intensity of the papilla, it is in inverse ratio to the diffusion of the retinal image.

The second characteristic (the more or less rapid movement of the shadow) is due to the fact that the amplitude of displacement of the image is smaller the greater the degree of ametropia. Whether there is a virtual image in a high degree of H, or a real image in a high degree of M, the phenomena will be the same.

Zone or Region of Poor Observation, and Neutral Point of Observation.—For M in which R=D (1 metre in my description) there is no image possible, since then the retina of the observed eye is the conjugate of the centre of the pupil of the observer, and therefore the ophthalmoscopic visual field is reduced to a mathematical point; at least it may, without appreciable error, be thus described. This special place where no image is possible is the neutral point of observation.

Coincidence of the Pupillary Plane of the Observer with the Plane of the Remote Point of the Observed—that is to say, the neutral point of observation—is characterized by instantaneous illumination followed by instantaneous obscuration of the pupil of the observed eye.—I should, however, mention that this is only to be realized with an artificial eye supplied with a good achromatic lens well diaphragmed. With the eye, it will be otherwise, on account of spherical aberration, chromatism, lack of homogeneity of media, and a certain amount of physiological As. These defects combined render perfect homocentric refraction for the eye impossible, and we will not have with it a true neutral point of observation, because all the rays emanating from the illuminated portion of the retina do not unite in an image situated in the same plane, that of the pupil of the observer. The determination of the neutral point of observation (and therefore of the remote point of the observed eye), though very easy in theory, will be much less so in practice. But for the observed who takes the precaution to keep himself at a good distance (for example, 1 metre), an error of even 10 centimetres in the fixation of the remote point is of no consequence, since it corresponds to only $\frac{1}{10}$ dioptre.

But if the observer is nearer, at 50, 33, 25, or 20 centimetres, where the remote point of M of 2, 3, 4, or 5 D. are respectively situated, the error increases very rapidly on approaching the observed eye, and if he goes still nearer, all exact determination of ametropia becomes impossible in high degrees of myopia, for an error of 2 centimetres, for example, in the fixation of the remote point with a metric ribbon will correspond to an error of 1 or more dioptres.

I have indicated above why the real fixation of the neutral point is so difficult. But it should also be said that for the observer placed a little within or without the remote point of the observed eye there is a true zone of poor observation (which I estimate at about 10 centimetres, if the shadow test is made at 1 metre, and which includes 5 centimetres within and 5 centimetres beyond the remote point). In fact, in all this zone the observer receives two divergent or two convergent rays. The phenomena of direct or inverse movement of the shadow is here indistinct, and becomes more indistinct as the divergence or convergence increases—that is to say, as the pupil of the observer approaches the remote point of the observed.

Astigmatism.—The simplest method of demonstrating the presence of As. by skiascopy is to find the position which gives an opposite play of the shadow in the two principal meridians—a play of the shadow characteristic or pathognomonic of As.

To determine the degree of As., the observer, still at a distance of 1 metre, should proceed as follows: Whatever be the variety of As., the least refractive meridian should first be made E with a concave or convex spherical glass, according to the method indicated above for H and M; the shadow then moves in the same direction as the mirror in this meridian, and in the opposite direction in the more refractive meridian. Concave cylinders of increasing strength, and with axis perpendicular to the more refractive meridian, should then be placed before the eye until the shadow becomes also direct in this meridian and has the same characters as in the other. A determination as exact as a quarter of a dioptre, as with the ophthalmometre of Javal, may thus be obtained.

It should, however, be stated that the determination of the principal meridians in total As. by means of ophthalmoscopic methods of optometry is less exact than that obtained by the Javal and Schioetz ophthalmometre in corneal As.

KERATOMETRY.—Dioptric systems with curved surfaces like the cornea and each surface of the lens produce two images: one by refraction or dioptrics, the other by reflection or catoptrics; the latter being identical with that of mirrors.

The size of the dioptric image depends upon the radius of curvature of the surface and the index of refraction of the medium. The size of the catoptric image depends only on the radius of curvature of the surface.

The index of refraction of the cornea being known (=1.33), its catoptric image may then serve to determine its dioptric power.

Kohlrausch, in 1839, used for this purpose an astronomical telescope. He placed in the focus of the ocular two hairs of spider's web parallel to each other, which he could, by a mechanical movement, approach one to the other without altering their parallelism. He made these two hairs coincide exactly with the corneal images from two planes placed on opposite sides of the telescope in the same horizontal plane, then, by means of a graduated scale substituted for the eye, he determined the distance between the reflected images. He thus calculated the radius of curvature of the cornea.

Senff, in 1846, employed almost the same method, but instead of flames he made use of two strips of paper fixed on a window. He found that the cornea was elliptical, measured the radius in different points of the same meridian, and calculated the axis and eccentricity of that meridian.

Cramer, in 1853, to examine the changes produced in the eye by accommodation, studied with a telescope the so-called Sanson or Purkinje images. He was thus able to establish the fact that during, as well as without, accommodation the catoptric image of the cornea remained constant in size, while that of the anterior surface of the lens diminished.

Helmholtz, in 1854, published a description of his ophthalmometre, an instrument based on the same principle as the heliometre invented by my compatriot, Bouguer, in the last century (1747)—that is to say, on the measurement of an image by its duplication. The ophthalmometre of Helmholtz possesses a great advantage: the small and inevitable movements of the head of the person examined, which, with the method of Kohlrausch and Senff, easily falsify the result, are of no consequence here, as the two images always move in the same manner, as in the heliometre, and their relative position does not change.

Doubling of the image may also be obtained by various methods: (*a*) by two plates of glass with parallel faces—one above, the other below—attached by their edge and not in the same plane (Helmholtz); (*b*) by two prisms superposed in contrary directions (Landolt), as in certain telemetres; and (*c*) by two portions of a lenz, one above and the other below, and displaced laterally in relation to each other, as in astronomical heliometres; (*d*) by a double refracting prism of Iceland spar (Coccius); (*e*) finally, by a Wollaston prism, which is composed of two rectangular prisms of quartz cut differently in the crystal and attached to each by their hypothenuses. The angle formed by the faces of each prism varies according to the doubling desired. Javal and Schioetz in 1881 chose the Wollaston prism as a means of duplication in their ophthalmometre. This instrument has greatly simplified the measurement of the radius of curvature of the cornea. By means of it keratometry, which was formerly purely a laboratory experiment, has become truly practical. Furthermore, the great number of articles called forth by this instrument, both in Europe and in the United States, in the last fourteen years, show the importance of this invention.

RESULTS OF OPHTHALMOMETRY.—For the last fourteen years an ever-increasing number of observers have made corneal measurements. Their names are given in the Memoirs of Ophthalmometry, published by Javal. This book includes the principal results known in 1890. I will briefly enumerate them:

General Form of the Cornea. — The results of Leroy's measurements, made in 1889, are: First, the curvature of the median horizontal section of the cornea diminishes from the centre to the periphery, and diminishes about four times as much on the nasal side as on the temporal side; second, the curvature of the median vertical section of the cornea diminishes from the centre to the periphery, and almost as much in the upper portion as in the lower.

It results from this, that the normal cornea is neither a sphere, an ellipsoid of revolution, nor an ellipsoid of three axes. Of these three surfaces, that from which it differs least is the ellipsoid of three axes, if it is supposed that this has been flattened at the nasal side.

Sulzer, in 1891, in an excellent article on his work in the ophthalmological laboratory of the Sorbonne (1) confirms the views of Leroy on the asymmetry of the cornea. This rapid and unequal diminution of the radius of curvature in the four directions—internal, external, superior, and inferior—from the summit of the cornea leads to important consequences from the standpoint of As. Sulzer thus formulates them :

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(1) SULZER: The form of the human cornea and its influence on vision. (*Arch. of Ophth.*, 1891 and 1892.)

1. The peripheral portions of the cornea without central As. show an inverse As.

2. The peripheral portions of the cornea in weak direct As. in the centre have no As. or an inverse As.

3. The peripheral portions of the cornea in inverse central As. are more As. in the same sense than the central portions.

4. The peripheral portions of the cornea in direct central As. of a moderate or high degree are more As. in the same sense than the central portions.

The As. of the peripheral portions thus differs from that of the central portions, and it is thus understood why artificial mydriasis, by allowing the peripheral portions to come into play, will modify the amount of As., and sometimes even change its form (inverse instead of direct As.).

Another consequence of this corneal asymmetry should be noticed : the impossibility of perfectly correcting the As. by cylindrical lenses.

Dioptric Power of the Cornea. — There is no correspondence between the dioptric power of the cornea and the general refraction of the eye. Indeed, the dioptric power of the cornea may be weak in M, strong in H, and it has been seen to present a difference of 8 D in eyes which have the same condition of refraction.

Even in E eyes the cornea does not have a uniform dioptric power. This varies from 39 to 45 D., with an average of 43.5 D. (Swan Burnet, 1888).

The two corneæ of a non-As. person have a noticeable equality of refraction, and this is generally true in spite of high degrees of anisometropia. In the same way in an As. person the maximum and minimum curvature of the principal meridians of the two corneæ are equal each to each, if the two eyes have the same degree of As. (Swan Burnet, Javal).

The radius of curvature of the cornea tends to increase from infancy to adult age, so that its dioptric power diminishes from 1.50 to 2 D. (Chibret.)

It is asked if the radius of curvature of the cornea depends on height or on sex. Researches made up to the present time have given no conclusive result (Tscherning and Bourgeois, Steiger).

Race seems to have no influence on the size of the radius of curvature of the cornea (Chibret.)

Relative Proportion of Direct and Inverse Corneal As.; Their Degree. Direction of the Principal Meridians. — Direct As. (the *vertical meridian* the more refractive) is the most frequent, and inverse As. (the horizontal meridian the more refractive) is only rarely seen—that is, in $\frac{1}{8}$ to $\frac{1}{10}$ of the cases.

Direct As. frequently reaches 1 to 3 D.; it may exceed 6 D. Inverse As. is relatively less, it rarely exceeds 3 D.; it is most commonly included between 0.75 and 1.50.

Value of the Total Astigmatism Deduced from the Value of the Corneal Astigmatism.—It should always be remembered that a static crystalline As. of about 0.75 is frequent, which becomes dominant when the corneal As. is very slight, and which compensates it partially to about 2.25 or 3 D. (Schioetz, Bull, Chibret, Martin). This explains why the total As. is less than the corneal when this is direct, while the contrary exists if the corneal As. is inverse.

Variability of Corneal Astigmatism. — It is generally stated that the corneal As. is invariable. Very exact observations on the same person at long intervals seem to demonstrate the contrary (Bull).

In some cases of hypertonia with glaucomatous symptoms inverse As. tends to replace direct As.; the hypertonia tends to displace the more refractive meridian from the vertical to the horizontal (Martin, Pflueger, and Eissen).

Compensating Astigmatic Accommodation.—Javal thinks that in a certain number of eyes, but exclusively among persons who use their spherical accommodation, there is a compensating astigmatic accommodation for their corneal astigmatism.

Eccentric Corneal Astigmatism. — When ophthalmometry is practised one is not slow to find that there are eyes for which investigation of the principal meridians by conformation is impossible. When the lines of the two mires are brought into coincidence the mires are deformed in a peculiar manner, which arises from the deformation produced by the eccentricity of revolution of the eyes. When such a case is met with, it goes without saying that the measurement of the corneal astigmatism as it is commonly practised is without value. Up to the present time observers have not sufficiently accounted for the decentration. One should always examine, in positions of non-conformation, if the mires are of equal size (Javal).

Spherical Refraction in Corrected As.—In general, in persons who have well established binocular vision, the more refractive meridians of the two eyes have the same refraction—that is to say, if the As. is corrected by convex cylinders, the same spherical glass ought to correct both eyes (Javal).

Advisability of Correcting Low Degrees of As.—One should not hesitate to prescribe weak cylinders, since low degrees of astigmatism may cause migraine, asthenopia, blepharitis, conjunctivitis, posterior staphylomas and facilitate the development of myopia (G. Martin).

Astigmatism and Strabismus.—In the majority of strabismic cases the most astigmatic eye is the deviating one, because the least astigmatic has been chosen for vision (Javal). And also: "It seems to me legitimate to conclude that As., as H, is a predisposing cause to convergent strabismus" (Chevallereau).

Astigmatism and Myopia.—Finally, uncorrected As. plays an important rôle in the development of myopia in school children (Javal, G. Martin).

Post-operative Astigmatism. — Following cataract extraction there is seen :

1. The eccentricity of the corneal ellipse increases in the meridian parallel to the section.
2. The eccentricity of the corneal ellipse diminishes in the meridian perpendicular to the section, so that this meridian has almost a circular curvature.

These modifications, very marked in the first days after the operation, diminish afterward, and are partially preserved in the vertical meridian (Scimemi, 1889).

It is nearly thirty years (1866) since Javal estimated the definite post-operative As. from cataract operations as averaging $\frac{1}{24}$—that is, 1.50 to 1.75 in dioptres. This value is still true.

Post-operative astigmatism is always irregular, although it may be in large part corrected. When it is due to a simple iridectomy, or to a cataract extraction with iridectomy, a discrepancy is frequently found between the ophthalmometric measurement and the subjective determination. This depends upon the fact that the iridectomy brings into use the peripheral portions of the cornea whose optical action is different from that of the centre.

On the Operation for Secondary Cataract.

DR. WICHERKIEWICZ (Posen).—There are two varieties of secondary cataract : first, the membranous secondary cataract complicated with synechias of the iris ; second, simple secondary cataract, formed by a simple thickening of the lens capsule without adhesions with the iris. In the first case, when the pupil is not completely obstructed, an endeavor should be made first to extract the membrane entire with forceps by a small peripheral incision in the cornea. If this is not easily done too great dragging should be avoided, and recourse should be had, as in cases where the pupil is completely obstructed, to iridectomy. A median triangular incision of the iris should be made with de Wecker's scissors. In the second case—that is to say, in simple secondary cataract—discission is sufficient; but to avoid chances of infection, a puncture made with Knapp's knife in the periphery of the cornea in the scleral limbus, 1 millimetre in front of the iris, should be preferred to puncture of the transparent cornea. I propose to give this operation the name of anterior scleronyxis.

Dr. Abadie (Paris).—We are to-day perfectly equipped for the treatment of secondary cataract. When there is only a capsular débris it is easily extracted with a more or less modified form of Liebreich's forceps. When the iris drawn into the wound has taken the place of the former pupil, it is sufficient to section it with de Wecker's scissors.

Finally, in the more favorable cases, when the iris is covered with false membranes, I recommended several years ago a method which consists in making two simultaneous sections with two lanced knives: the scissors are introduced through the first incision, and with two cuts of the scissors a large flap is cut out, which is seized with forceps introduced through the second opening, and then drawn outside and excised. In this way dragging on the iris is avoided, which is always to be feared.

Dr. de Wecker (Paris).—I do not wish to undertake a discussion on the operation for cataract, which will lead us too far. However, I would like to state that every one now concedes that the accidents which may follow extraction may be traced to infection; so our attention should be given to the character of the wound, in order to avoid any immigration of germs. The same principles should be applied to the various methods of operation for secondary cataract, and the results will be the more certain, as the wound is more circumscribed, and as perfectly disinfected instruments are used.

Dr. Galezowski (Paris).—I think that haste should especially be avoided in operation for secondary cataract. The choice of situation for intervention also has its importance, and I prefer the central portions of the cornea.

Dr. Wicherkiewicz.—I will reply to Dr. Abadie that corneal wounds, even the smallest ones, should be avoided as far as possible, because they are more susceptible of infection than sclero-corneal wounds. I have had infections occur two or three days after an operation for discission, and it was clear that the infection originated in the small puncture of the transparent cornea, and that it progressed from the cornea toward the interior of the eye.

Endothelial Sarcoma of the Choroid.

Dr. Parisotti (Rome).—(To be published in full).

Electrolysis in the Treatment of Detachment of the Retina.

DR. TERSON (Toulouse).—(To be published in full.)

Detachment of the Retina and Its Treatment.

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In 1880 I sutured in detached retina with catgut and obtained a ew favorable results, but also some failures, which led me to abanon this method for another, which consists in performing repeated nd multiple ophthalmotomies with suture, with an ophthalmotome n the form of a curved needle, which I have had constructed for his purpose.

Double Retinal Detachment in a Child Four Years of Age.

DR. TEILLAIS (Nantes).—Detachment of the retina, while very ommon in all ages, is certainly of very rare exception in childhood, ut it deserves still greater attention when it attacks both eyes and s produced under circumstances so unforeseen that the etiological uestion seems to be a veritable problem for solution.

In the case which I wish to describe to you, the first signs of a hange in vision were an uncertainty in the gait of the child, and hen undecided movements of the head, which tended to incline to one ide. Both eyes were well formed, and showed no fault in developnent of structure. As the child had had good vision, the idea of a ongenital lesion is immediately rejected, and that of progressive iminution in vision is certainly linked with a relatively recent ffection of the fundus of the eye.

Ophthalmoscopic examination gave the following results : In the ight eye, slight opacities of the vitreous and detachment of the etina above to a limited extent.

In the left *eye, detachment* of the retina, including the entire is to say, in simple secondary cataract—discission is sufficient; but to avoid chances of infection, a puncture made with Knapp's knife in the periphery of the cornea in the scleral limbus, 1 millimetre in front of the iris, should be preferred to puncture of the transparent cornea. I propose to give this operation the name of anterior scleronyxis.

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In the case which I wish to describe to you, the first signs of a change in vision were an uncertainty in the gait of the child, and then undecided movements of the head, which tended to incline to one side. Both eyes were well formed, and showed no fault in development of structure. As the child had had good vision, the idea of a congenital lesion is immediately rejected, and that of progressive diminution in vision is certainly linked with a relatively recent affection of the fundus of the eye.

Ophthalmoscopic examination gave the following results : In the right eye, slight opacities of the vitreous and detachment of the retina above to a limited extent.

In the left eye, detachment of the retina, including the entire upper segment, abundant flocculi in the vitreous, and filaments resembling the débris of extravasated blood ; in the retina, white patches of regression of blood foci.

As the diagnosis is indisputable, the interest centres in the etiology.

The only disease that the child had had was a severe attack of whooping-cough complicated with convulsions and hemorrhagic phenomena, sub-conjunctival effusions, epistaxis, sub-cutaneous ecchymosis, and flux of blood from the ear.

After reviewing the different causes likely to cause detachment of the retina, which could not be rejected *à priori*, and which were only excluded by analysis, the only acceptable one which remained as an etiological factor was that of hemorrhage of the retina and of the vitreous, which occurred in the course of the whooping-cough.

If to this is added the influence of repeated coughing, and the convulsions provoked by the violence of the incessant attacks, we have the two principal factors of double detachment of the retina in a child four years of age, which is a pathological fact without example up to the present time.

Dr. Sulzer (Geneva).—Some weeks ago, I observed a case of double progressive detachment of the retina in a patient twelve years of age. Besides being bilateral, this disease presented peculiarities which sharply distinguished it from the various kinds of retinal detachment ordinarily observed. It began in the left eye about two months before, and a short time after attacked the other eye. The progress of the disease was slowly progressive in both eyes. Vision is now reduced to counting fingers at a distance of from 1 to 2 metres. With the ophthalmoscope, an undulated swelling of the peripheral portions of the retina is seen.' This swelling exists in all directions, and is hardly more pronounced below than above. The papilla and surrounding portions of the retina are sarcomatous. There is a diffuse disturbance of the deep portions of the vitreous. No history of the patient explains the etiology of the ocular diseases, and the treatment employed has been ineffectual.

Dr. Dor (Lyons).—For the past year I have obtained very good results in the treatment of detachment by combining Heurteloup's blood-letting with the application of three or four galvano-cautery points over the detached retina. The cauterization must be repeated twice, and later, once a week.

Dr. Dianoux (Nantes).—I have had good results from the subconjunctival injection of 1 c. c. of a saturated solution of chloride of *sodium* over the detachment.

Dr. Abadie.— I have only made slight modifications in the first technique which I described, and the results which I have obtained are almost the same as Dr. Terson's—from time to time a marked success, most frequently considerable improvement, and—an important fact—never a serious accident.

In old detachments, practically no result is obtained, and I have renounced it in such cases.

On the other hand, in juvenile non-myopic detachments success is constant—five in five cases.

I have endeavored to make several punctures with simultaneous electrolysis, but have not found it of any advantage. I prefer to make a second puncture several days after the first when this has produced no result.

Dr. Parinaud (Paris).—In the treatment of detachment of the retina by electrolysis a puncture of the sclera is made with a knife or a needle. But the results obtained can be explained by this puncture alone. Partisans of this method tell us that detachment of the retina, especially if it is recent, is frequently improved and sometimes cured. This is the same result which I obtained by a posterior sclerotomy, which, in my opinion, is the best and least dangerous treatment of detachment of the retina.

Dr. Boucheron (Paris).—There are still several points which should be mentioned.

The great majority of detachments of the retina cured by any method whatever are recent cases—that is, eight days or under. After that length of time the results become more and more doubtful and rare.

When the macula lutea is detached restoration of central vision is impossible; there is probably no case on record of restoration of central vision after detachment of the macula. The re-attachment of the retina, if it can be brought about, should, then, be effected before macula detachment to realize the greatest cure. The therapeutic period of the greatest advantage is when the detachment is still situated above.

If, then, it is essential to act early and quickly, what therapeutic tactics should be followed? It would seem, from what has preceded, and from my own experience, that operative intervention should be employed without delay. The operation chosen should have for its aim to reduce the ocular tension on the exterior surface of the retina, so that the tension on its interior surface shall increase either directly or indirectly (injections into the vitreous). Therefore, any puncture of the eyeball in the cornea or in the sclera will accomplish this fundamental fact.

When the retinal detachment is recent, with intact macular vision, the least dangerous operations would naturally be chosen, which are performed in the anterior segment of the eye (iridectomy, sclerotomy, repeated paracentesis, etc.), in order to preserve the sensory regions of the eye.

As for the older cases, the extensive detachments, whether sclero-choroidal or retino-sclero-choroidal punctures are used with or without electrolysis, they should always be combined with appropriate internal medication.

But since at the beginning of the treatment the principal indication is to gain time, it is by surgical interference that the cure of recent detachments should be commenced.

Dr. de Wecker.—The only difference between electrolysis and punctures is that in the former the opening is maintained, and forms a good drainage.

Dr. Wicherkiewicz.—I think that in detachment of the retina all operative interference should be avoided. Recovery may occur spontaneously.

Dr. Motais (Angiers).—In eleven cases of recent detachment of the retina which I treated with galvano-cautery points I have obtained three improvements and two recoveries. These are quite as good results as those obtained by the more dangerous method. I think, then, that it is prudent to rely on a method at least as efficacious as the others, and which never has the slightest complication.

On the Best Method of Treatment of Prolapse.

DR. GRANDCLEMENT (Lyons).—The following are the conclusions of my article :

Every *prolapse of the iris* left to itself is a permanent source of danger to the eye and to vision ; it threatens it either with *staphyloma* or *infection.*

It should, then, be immediately combated with surgical interference, for its spontaneous reduction, or reduction with eserine or atropine, is a rare and exceptional occurrence.

The three operative methods commonly employed are :

Excision, which is dangerous and very inconvenient.

Cauterization, which is painful and frequently inefficient.

Incision, which, on the other hand, if properly performed, gives a sure and rapid result.

This incision should consist in cutting the prolapsed tumor from side to side in the direction of its greatest diameter.

Dr. Chibret.—The method of Grandclément is very good, but I think it is still better to avoid prolapse, and for this purpose I have described a method which consists in introducing the de Wecker scissors after extraction of the lens and seizing the iris if it presents itself between the branches of the scissors. Under these conditions, it is true, iridectomy will be performed in about 70 per cent. of the cases.

Dr. Dianoux.—I have attempted Chibret's method, but I have always been obliged to cut a fragment of the iris.

Iritis of Nasal Origin.

DR. FAGE (Amiens).—Since Ziem pointed out the relations which exist between nasal disease and certain forms of iritis, I have not found in medical literature a case in which ozæna figured as cause of iritis.

I have had a patient, twenty-two years of age, with ozæna, who, outside of his nasal affection, had no other cause of infection. In the beginning of January, an iritis developed in the left eye, and later the right eye showed symptoms of irdo-choroiditis. There was atrophic rhinitis in the nose, and the nasal mucous membrane contained the cocci-bacillus of Loevenberg almost pure. I found the same microbe in the conjunctival cul-de-sac, but a search for it in the blood and the anterior chamber was ineffectual. Nevertheless, the eye of a rabbit, which was inoculated with a needle which had served for the paracentesis, became infected. The sinuses were transparent.

The latter part of April, the left eye had recovered, with persistence of some exudation in the anterior chamber. The right eye still remained inflamed with marked disturbance of the aqueous humor and changes in the vitreous.

These ocular lesions are to be attributed to infection produced by the microbe of ozæna, which is an agent capable of producing infection at a distance, provided the entrance of the blood vessels or lymphatics remain open. To say that a true infection should produce suppuration, is to deny weaker infections of which clinical experience gives us daily examples.

It is admissible, in cases where the nasal fossæ contain no pathogenic microbes, and where there is simply congestion of the iris, to attribute it to simple vascular disturbances; but the theory of infection should always be considered when, as in my patient, there is severe and tenacious iritis and a nasal disease the virulent microbial nature of which has been experimentally established.

Dr. E. Berger (Paris).—I have observed a case of iritis and otitis media of the right side, due to purulent rhinitis on the same side, caused by retention of the nasal secretion from an obstruction of the right nasal fossæ by a tumor of the nasal pharyngeal cavity. Partial extirpation of the tumor was followed by improvement of the iritis and the otitis. Its new growth provoked an aggravation of the two diseases, which only recovered after total extirpation of the tumor.

The explanation of the danger of ozæna to the organ of vision by the results of bacteriological research is still somewhat uncertain. Terson and Gabrielides have found the cocco-bacillus of Loevenberg, in patients with ozæna, in the lachrymal fluid without alterations of the conjunctiva; on the other hand, in several ozæna patients observed by Dr. Berger, in whom there was a severe ocular disease, this bacillus was not found in the lachrymal fluid. These latter cases must be explained either by an increase of the virulence of the pyogenic microbes in these patients, or, rather, by the action of the toxines of the bacillus of ozæna. Dr. Berger explains by this action of toxines a case of central scotoma in a woman, thirty-two years of age, with ozæna, in whom the treatment of the latter was followed by an improvement of vision.

Dr. Mazet (Bordeaux).—The characteristics of Loevenberg's bacillus are not sufficiently differentiated from the bacillus of Friedlander. In cases of ozæna there are always other micro-organisms which may be the cause of ocular infection, and the case of Dr. Fage does not prove that this was actually an iritis of ozænous origin.

Dr. Fage.—I have simply attempted to establish this clinical type, as the disease had not yet been described.

The Common Etiology of Parenchymatous Keratitis and Choroiditis.

DR. CHIBRET (Clermont-Ferrand).—Parenchymatous keratitis does not form a special manifestation in hereditary syphilis. If it is most frequently observed in syphilitic children, it is because the child is more exposed than the adult syphilitic to all diseases of the cornea.

The period of puberty is especially favorable to the development of parenchymatous keratitis.

Exudative choroiditis is similar to parenchymatous keratitis, and deserves the same qualification to indicate an identical process and etiology. The two diseases are characterized by the presence of gommas more or less circumscribed, more or less diffuse or confluent.

Certain forms of descemetitis of dental origin simulate parenchymatous keratitis; they are differentiated by the fact that mercury aggravates them instead of improving them.

Exudative choroiditis is quite as effectually influenced by mercury as parenchymatous keratitis.

With the new methods of treatment by injection, and a more exact conception of the action of mercury and iodide of potassium, the progress of parenchymatous keratitis and choroiditis may be arrested, the second eye preserved from attack, and recurrences opposed, which was formerly not admitted as possible.

Dr. Wicherkiewicz has seen cases of parenchymatous keratitis in scrofulous patients, especially after grip.

Dr. Galezowski.—Parenchymatous keratitis is always caused by hereditary syphilis.

Dr. Abadie.—Parenchymatous keratitis is most frequently due to syphilis. In the more severe forms of keratitis, good results are obtained from sub-cutaneous injections with the salts of mercury, but implication of the second eye cannot be avoided.

Dr. Chibret.—I do not attach any great importance to the memory of the patient in establishing the etiology of syphilis, and I believe fully in the importance of the specific action of mercury. As for the action of grip, I have noticed from my records, which I have preserved for many years, that a great many of my old syphilitic patients have had new diseases after grip. I am persuaded that true interstitial keratitis is always of syphilitic origin.

Dr. Antonelli (Naples) described a form of parenchymatous keratitis which is quite rare, and which has an origin and development common to that of uveitis and secondary acquired syphilis. The corneal infiltration is superficial, and produces no more peri-corneal injection than that of the concomitant iritis; the cornea shows no epithelial changes, is never vascularized, and may resume its transparency in a few weeks, while the iritis recovers under specific treatment. This form is, then, quite different from typical diffuse interstitial keratitis, and it is only described by Hock, under the name of punctate interstitial keratitis.

Seven Years of Ophthalmology in the Hospital Pen-Bron.

DR. DIANOUX.—(To be published in full.)

On the Use of Large Sub-conjunctival Injections.

DR. DE WECKER does not think that an antiseptic action can be obtained from the sub-conjunctival injection of a few drops of a $\frac{1}{1000}$ or $\frac{2}{1000}$ solution of sublimate, only a very small fraction of which enters the eye.

As he in no way favors the homœopathic system, he recommends, in ulcerating conditions of the cornea, the injection of a half or a full syringe full of a solution of sublimate $\frac{1}{2000}$ under the conjunctiva. (To be published in full.)

Dr. Vignes.—Sub-conjunctival injections of the salts of mercury have given me such unsatisfactory results in the treatment of choroiditis that I have sought other treatment. I have had recourse to the *use of sub-cutaneous* injections of iodine. I am at present studying their action, and the number of patients that I have examined does not seem to be sufficient to definitely state the result. If I speak of it to-day, it is simply to put myself on record.

One of my patients, whom several of my colleagues present wished to examine, was emmetropic, had a double disseminated choroidoretinitis with macular lesions, and came to my clinic with a vision of $\frac{1}{10}$. After fifteen days' treatment, vision increased to $\frac{4}{10}$. Rest for a month: the condition remained stationary. Renewal of the treatment for fifteen days: vision increased to $\frac{8}{10}$. I have made other observations of equal significance.

Dr. Darier.—I am glad to notice the conversion of Dr. de Wecker to the method of sub-conjunctival injections of sublimate. As to the question of dosage, I do not think there is any advantage to be gained by injecting large quantities, as de Wecker recommends.

In 1888, I performed injections of large quantity, and I therefore do not see how Dr. de Wecker can claim priority for this modification in the method of sub-conjunctival injection.

Dr. Abadie.—When Dr. Darier made his first experiment with sub-conjunctival injections of sublimate at my clinic I did not always agree with him as to the therapeutic results which he thought could be obtained. I am scarcely a partisan of this method in diseases of the fundus of the eye, but I claim its undoubted superiority in the treatment of infectious ulcers of the cornea.

I am glad to see that there seems to be unanimity of opinion to-day on this point. There is no need of large doses in infectious ulcers, and I have treated very serious ones : in ozæna, injections of 3 to 4 drops of a $\frac{1}{1000}$ solution have given results complete and superior to all other forms of treatment, since the corneal tissue was completely respected.

Dr. de Wecker.—I would reply to Dr. Darier that I did not claim any priority for the method of large injections, but I also refuse him this priority, which he seems to claim, for it is not sufficient to say "I have done such and such a thing at such a time" to claim precedence ; it should be based on a publication. This priority is without doubt due to our Italian colleagues.

Dr. Darier is mistaken if he thinks that I have been inconsistent in praising large injections to-day, and that I now recognize the utility of sub-conjunctival injections in general. Far from that, I retain my opinion; and I agree perfectly with my colleagues from Naples, as I stated in my article, that injections are excellent in infectious diseases of the cornea, but are otherwise ineffectual.

To my friend Abadie, I would say that if large injections are used, it is because injections of 1 or 2 drops have given far less satisfactory esults, and I would heartily recommend large injections of sub-imate in every infection of the eye.

Congenital Malignant Tumor of the Orbit.

DR. LAGRANGE (Bordeaux).—Congenital malignant tumors are ery rare. Here is a case seen at the Children's Hospital at Bor-eaux. It is not only remarkable for its extreme rarity, but more o from the peculiar histological structure of the tumor.

This developed during intra-uterine life. At birth, it had eached the size of a moderate-sized pear, entirely filling the dis-ended orbit, and having no relation with the eye and optic nerve, xcept propinquity, and connecting with the brain by the sphenoi-al fissure.

Microscopic examination showed that it was a tumor of multiple issues formed of two varieties of embryonic elements, one belonging o the connective tissue type, and the other to the nervous type. he latter elements were similar to those which are found at the eginning of the development of the spinal cord and brain; they ere abundant in the tumor, which therefore deserved the name of lioma, although it in no way resembled gliomas of the retina, hich are, in reality, only pure sarcomas with great differences in heir structure, and having no truly characteristic structure.

rbital Tumor Produced by Dilatation of the Ethmoidal Sinuses.

DR. ROHMER (Nancy), reports the case of a patient twenty-one ears old, who four years ago was attacked with dilatation of the thmoidal sinus. The author makes the following conclusions:

1st. Distention of the ethmoidal sinus will be shown before t is opened by a projection of the internal wall of the orbit, which ay be more or less sensitive, or even painful, and which may reach he size of a small nut, or larger, and extends along the internal wall f the orbit to the fundus of the cavity; vigorous pressure with the inger will reveal parchment crepitation, which, combined with the ollowing signs, will eliminate the idea of a true orbital tumor.

2d. There will be œdema, especially in the lower lid and in the alar and temporal regions, caused by compression of the ophthalmic ein, which, after following the internal wall of the orbit, traverses he sphenoidal fissure to empty into the cavernous sinus.

3d. Lesions from inflammation in the vicinity or from pressure on he optic nerve will be slow to appear in disease of the ethmoid or rontal sinuses, while they will appear relatively quicker when there s distention of the sphenoidal sinus (Panas). The projection of the thmoidal wall *of the orbit* will have the effect of pushing the eye en *asse toward the lower* external angle of the orbital cavity, while the optic nerve will long be spared, and vision will remain good for a relatively long period. I should also add that meningitis complications, as well as inflammations of the cavernous sinus and of the ophthalmic vein, will also be more frequent in cases of lesions of the cavities of the sphenoid.

4th. The large opening of the orbit, aided if necessary by nasal catheterization, will decide the question and allow of precise localization of the lesion.

Some Remarks on Orbital Thrombo-Phlebitis.

Dr. MITVALSKY (Prague).—In cases of direct or centripetal orbital thrombo-phlebitis vision is preserved while the patient survives, while in the case of recurrent thrombo-phlebitis vision is abolished from the appearance of the chemosis and the exophthalmus. In the first case, the central vein of the retina and some of the small retinal veins are preserved and circulation is there free. In the second case there are thromboses in all the veins and inflammatory endo-vascular lesions. The retinal circulation is therefore prevented from the commencement of the disease.

Contribution to the Diagnosis of Vascular Tumors of the Orbit.

DR. JOCQS (Paris).—I desire in this article to consider a rare symptom which may aid in the diagnosis of vascular tumors of the orbit. This symptom consists in the arrest of the souffle by pressure of the tributaries of the ophthalmic vein. I have only found one case, that of Dr. de Wecker, in which this symptom was described. I have myself once observed it in a patient who had both souffle and exophthalmus, and in whom the diagnosis of retro-bulbar vascular tumor was not doubtful. This souffle seemed to be due to pressure of the ophthalmic artery by the dilated ophthalmic vein.

The pathogenesis of venous dilatation may be explained in traumatic cases by a fracture of the sphenoidal fissure; in spontaneous cases, by endo-phlebitis.

This symptom eliminates the idea of arterio-venous aneurism, which sometimes necessitates ligature of the carotid. In case of venous dilatation, on the contrary, there can be no question of surgical interference. Medical treatment alone should be employed with pressure on the eyeball. Recovery seems to be possible.

Orbital Fibro-Sarcoma.

DR. KALT (Paris).—I lately operated on a girl sixteen years of age, who for two years and a half had had an orbital tumor of very peculiar development. At first there was a reddish-yellow plaque on the upper external portion of the bulbar conjunctiva, which extended to the upper fornix. Little by little, this infiltration gained the orbit, apparently disappearing at the point of origin. In two years a tumor was felt behind the eyeball, which seemed to adhere to the external orbital wall and surrounded the external rectus.

Exenteration of the orbital contents showed that the external rectus muscle was surrounded with a thick envelope of hard fibrous tissue, which stretched to its posterior extremity and laterally reached to the superior rectus and the lachrymal gland.

Histologically, it was found that the principal mass was composed of round and fusiform cells, and of vessels with adult or embryonic walls. The expansion of the tumor in the muscles and the lachrymal gland was uniformly embryonic.

This examination showed that it was a sarcoma which had originated in the bulbar portion of Tenon's capsule, and had then gained the orbital cavity. As many sarcomas seemed to have an external infectious origin, it is interesting to note that in this case the point of origin was the sub-conjunctival tissue, so exposed to infections of all kinds.

Ophthalmoscopic Examination with the Inverted Image of Highly Myopic Eyes.

DR. L. DEMICHERI.—(To be published in full.)

Anatomical Landmarks in Surgical Operations in the Orbital Region; Description of an Instrument.

DR. MOTAIS.—For the surgical topography in the orbital region, I propose two landmarks which have been of great service to me in my anatomical dissections: outward, the external orbital border at the commissure; inward, the point of insertion of the tendon of the orbicularis.

The instrument (orbitometre) which I have had made to utilize these two landmarks is composed of two branches of a compass with blunt extremities, a horizontal bar graduated in millimetres on which glides a graduated vertical bar, which carries a stylus with a tampon of aniline.

Its use is most simple. A table shows the distance in relation to the landmarks of all the principal points, to be determined with variations according to the differences in size of the orbital opening. For example, for the orbital insertion of the inferior oblique muscle I fix the vertical bar at 26 millimetres on the horizontal bar. The stylus, descending on the vertical bar until it meets the lower orbital border, inscribes without possible error the point sought for.

The *determination of* the points of immergence of the frontal nerves, internally and externally, of the nasal nerve, of the infra-orbital nerve, of the supra-orbital nerve, etc., are also simple. The lines of direction of certain organs in the orbital cavity (the frontal nerve, oblique and recti muscles, ailerons, etc.) may also be determined with the orbitometre. Finally, symmetrical points of the posterior hemisphere of the eyeball may be inscribed on the anterior hemisphere, the bulbar insertion of the oblique muscles, etc., thus rendering possible very rational operations, which have as yet been considered impracticable.

Dr. Sulzer remarked that Dr. Motais's instrument might be utilized in measuring exophthalmus.

Cleaning out Cortical Masses in Cataract Operation by Injection and Aspiration.

DR. DRANSART (Somain) advises aspiration of the lens detritus by means of Chibret's instrument (a syringe with a double current). It is the best method of obtaining good vision after cataract operation, and also the surest guarantee against prolapse of the iris. He reviewed recent articles on this question: the thesis of Betremieux, the practice of Coppez and Redard.

Dr. Wicherkiewicz stated that in 1886 he had proposed a special instrument for extracting lens masses.

Dr. Vacher (Orléans), who is in favor of these post-operative injections, performs them with a rubber bulb.

Dr. Panas (Paris) has abandoned the rubber bulb to return to the syringe, which is less likely to allow air bubbles to enter; he proposes, however, with these injections rather to sterilize the anterior chamber than to evacuate the cortical masses.

Dr. Parinaud has a rubber bulb and a glass pipette, so that the entire instrument may be sterilized by boiling.

Dr. Galezowski prefers removing the masses with a curette.

Dr. Darier (Paris) fears that syringes of double action (Chibret's instrument) expose the iris to injury.

Dr. Parisotti (Rome).—I think that the cleaning out of the anterior chamber is only serviceable in cases where simple massage would be sufficient. It is to be hoped that those who advise drainage of the anterior chamber can assure us that they have always obtained the maximum vision in cases where there are sticky cortical masses difficult of detachment.

General and Refractive Modifications of the Eyeball Following Extraction of the Lens.

DR. TRUC (Montpellier).—Clinically, loss of the emmetropic lens is corrected by a spectacle glass of 10 or 11 dioptres, and may be estimated at 10 dioptres. There are, however, marked differences in myopia, and may be in hypermetropia. At any rate, in the refraction of the aphakic eye the total and refractive modifications possible in the eyeball have never been taken into consideration. They are, however, interesting. As we can only exceptionally measure, weigh, and gauge the human aphakic eye in comparison to its normal mate, I have experimented on animals, especially rabbits. Extraction was performed on one eye by various methods, and the other remained intact, and then both were exactly compared.

In fifteen successful operations,. I found the aphakic eye, on an average, lighter by 0.20 gr., smaller by 0.130 c. c., and reduced by 0.6 millim. in the antero-posterior diameter; these figures have the greater value, as precise calculation showed that in the normal condition the right eye is somewhat larger, heavier, and more voluminous than the left eye.

In the new-born or very young subjects the development of the eye may be diminished as that of the orbit after enucleation, but my little animals did not survive, so I could not verify this. There is always retraction of the eyeball, and the removed lens will not be completely replaced by the aqueous or the vitreous, as is supposed; besides, there will be axillary H. of about 2 D. Removal of the lens seems, in fact, to modify the entire eyeball, and the diminution of the refraction seems to be due, not only to loss of the lens, but also to retraction of the eyeball. This retraction may be greater in M. with a large staphyloma, and less in H. These ideas are, I think, new, but are as yet provisional, as the experiments are complex and still few in number.

Dr. Chibret.—Ophthalmometric measurements led me several years ago to the conclusion that extraction of the lens produced not only deformation of the cornea, but also a shortening of the antero-posterior axis of the eye.

Dr. de Wecker.—The rigid sclera of old people, in my opinion, does not permit of a change of form of the eye after lens extraction.

Dr. Parinaud.—I have had occasion to observe a case in which excessive myopia developed after extraction of both lenses at the age of six years. There was also detachment of the retina.

Dr. Motais.—The retractor muscle, which exists in the rabbit but not in man, may produce a flattening of the eyeball after extraction of the lens of a rabbit. This muscle may thus be a source of error.

Dr. Truc.—I find, as I thought, that the subject of my article is quite new, and as it is interesting, I shall be glad to continue my experiments.

The possible retraction of the eyeball after removal of the lens has been exceptionally and hypothetically supposed, but it has never been investigated; I have found it in two cases, the first of which gave me the first idea of undertaking these experiments.

Dr. de Wecker seems to think that retraction of the aphakic eye in an old person is hardly possible; if it seems more rational in a child with a supple eye, it is also so, though in a less degree, in the adult or old person. I do not think that the retractor muscle of the eye has any marked effect in producing flattening of the eyeball; it is, however, a point to be considered.

A New Application of Torric Lenses for the Correction of Certain Forms of Irregular Astigmatism.

DR. JAVAL (Paris).—Torric lenses are ordinarily cut on the equatorial border of the torus. They may be cut on the horizontal face of the coronna which forms the torus, and then lenses are produced whose focal image is projected according to a regular curve.

These glasses are suitable for correcting that particular kind of ametropia the knowledge of which is still quite recent—that is, decentration of the eye.

Dr. de Wecker.—Is the visual defect of which Dr. Javal speaks the result of malformation or of a pathological condition? Is there a special physiological form?

Severe Ocular Manifestations of Syphilis and Their Treatment.

DR. ABADIE.—I call severe ocular manifestations of syphilis those which involve the choroid, retina, or optic nerve, are of rapid development, and which, if left to themselves, or are improperly cared for, lead, in a short time, to irreparable loss of vision.

Commonly, these ocular complications are late to appear. They show themselves ten, fifteen, or twenty years after the initial lesion in patients who have had to that time insignificant or no complications and who have not undergone prolonged mercurial treatment. Exceptionally, in the form of secondary complications, the deep membranes of the eye and the optic nerve may become involved. The prognosis of these lesions is, then, quite serious if they are given time to disorganize the sensory elements of the retina, and their treatment should be energetic.

Mercury administered by the digestive tract, pills of proto-iodide, Guibert's iodide, and iodide of potassium are altogether insufficient. Recourse must be had to sub-cutaneous injections of cyanide or bichloride of mercury, and, in the more severe cases, to intra-venous injections of the same solutions.

For more than a year I have daily performed ten or twelve intra-venous injections, and have never had a single accident. I have had accidents with sub-cutaneous injections, which sometimes produce an abscess, but I have never seen this with intra-venous injections.

But to obtain such results a special apparatus is necessary, and, still more, rigorous antisepsis : I wash the region where I intend to make the injection very lightly with a $\frac{1}{2000}$ sublimate solution, and apply a ligature to the upper portion of the arm.

I use a syringe made entirely of glass ; the piston is also of glass. It is a very simple instrument, with which no accidents ever occur. With a flax piston, in which the substance may unravel or tear off, accidents may happen, while with a glass instrument there is not the least fear of danger.

Dr. Abadie presented several cases in which vision which had become defective in spite of the employment of classical treatment was only maintained by means of sub-cutaneous or intra-venous injections of salts of mercury.

Dr. Galezowski.—Baccelli was the first to successfully perform intra-venous injections of sublimate, but Karmanski claims to have had serious accidents as the result of this treatment. In choroiditis I have found nothing as good as mercurial inunctions, only they must be continued for a long period, and especially without interruption. Two years' treatment is necessary.

Dr. Chibret.—At the present time the superiority of injections seems to be incontestably established ; the prolongation of their use is more susceptible of discussion. Mercury finally becomes a poison which must be eliminated. Albuminuric persons must be particularly watched in this respect.

Dr. Parisotti comfirms the results obtained by Dr. Abadie after what he had seen at Baccelli's clinic. There is no danger in making these injections, and the results are very encouraging.

Dr. A. Darier recommends injections which are really mercurial transfusions. He injects 5 c. c. of a $\frac{1}{1000}$ solution of cyanide of mercury in artificial serus.

Dr. Abadie.—I know very well, as every one does, that Baccelli was the first to perform intra-venous injections of sublimate, so I have no intention of claiming precedence for this. I desire simply to describe the very encouraging results of this method, and to state that there are severe forms of ocular syphilis which have resisted all other forms of medication but have been improved by intra-venous injections.

Posterior Sclerotomy and Sclerectomy in Glaucoma.

Dr. PARINAUD.—(Published in full in this number, p. 305.)

Dr. Masselon.—I do not believe that the kind of angular scleral puncture which Dr. Parinaud describes can be recommended for constant use; it exposes the eye to internal hemorrhages which are not always easily reabsorbed, and may lead to permanent alterations. Nevertheless, the scleral wound, as Dr. Parinaud says, should not be too narrow, and if a very tapering cataract knife is used (de Wecker's knife), the section must be slightly enlarged. The ancients, who commonly performed this kind of an operation to combat glaucoma, which they called hydropsy of the vitreous humor, employed a cataract needle—that is, a narrow lanceolate knife.

Dr. Terson.—I only perform posterior sclerotomy in eyes where the vision is lost. I think that the vitreous should only be disturbed when there is nothing else to do. When puncture is practised it should be repeated several times, and always in the same place. In a patient with hemorrhagic glaucoma, I repeated the puncture six times and obtained a cystoid cicatrix.

Dr. Jocqs considers posterior sclerotomy as perfectly justifiable in cases of acute glaucoma where iridectomy is not feasible for one reason or another—for example, where chloroform cannot be given.

Dr. Galezowski recommends anterior sclerotomy, so as to act upon the canal of Schlemm.

Dr. Motais said that he had never seen the hemorrhagic accidents in the vitreous mentioned by Dr. Masselon, because he made his puncture quite near the cornea and far from the more vascular region of the choroid.

Dr. Parinaud.—It is quite possible that a hemorrhage of the vitreous may occur after posterior sclerotomy, but this hemorrhage is quite rare and is never serious; it is far less serious than prolapse of the iris, which sometimes complicates anterior sclerotomy, even in the hands of the best operators.

Glaucoma and Myopia.

DR. PUECH (Bordeaux) described the case of a patient who had a first attack of glaucoma at the age of twenty, at which time the vision was excellent, the patient being emmetropic.

he attacks were renewed at various intervals, though not with the nary severity. After each attack the eye, under the influence of increase of intra-ocular pressure, elongated at the expense of the ry region, the sclera of which finally was thinned out and assumed color of a ciliary staphyloma.

he first effect of the elongation of the antero-posterior axis was development of myopia, which, at first slight (3 dioptres), has reached 10 dioptres. Glaucoma in this particular case pro- ed a myopic eye.

r. *Dransart* (Somain).—Cusco and Laqueur have observed trans- nations of glaucoma into myopia. I personally have seen this nsformation occur in a man eighty-five years old. These cases horize us to combat the myopia with sclerotomy.

r. *Despagnet* (Paris).—In progressive myopia peri-orbital pains observed, due to an exaggeration of tension. These pains yield to ectomy, but not to sclerotomy.

r. *de Spéville* (Paris).—In a case of sub-acute glaucoma I per- ned iridectomy on one eye and sclerotomy on the other in the e sitting. The sclerotomized eye is now the better of the two.

sults of the Operation for Entropion and Ptosis by the Methods of Gillet de Grandmont.

R. Bourgeois (Rheims).—I have constantly used these methods have had nothing but successes. In some cases, for entropion, operation may be completed by external canthoplasty. In ptosis, t is very marked and a first intervention has not produced a plete correction, it may be cured by one or two sutures according he method of Dransart. In fact, these methods are simple in r execution, always effective, and remarkable for their permanency. y deserve a high rank among classical methods.

A Rare Complication After Cataract Extraction.

R. de Spéville (Paris).—(To be published in full.)

rcurial Exanthemata (Cutaneous and Ocular Hemorrhages).

R. Guibert (Roche-sur-Yon) reported two cases in which com- atively small doses of mercury produced cutaneous hemorrhages parable in every way to those of *purpura hemorrhagica*. These hemorrhages in both cases were accompanied with ocular hemorrhages. Mercury had been injected in the form of the oil of the bi-iodide (Prof. Panas' formula).

The author attributes these hemorrhages, not to the method employed (he knows of no method better or more prompt), but to an idiosyncrasy on the part of the patients which should put us on our guard against the abuse of mercurial treatment.

Blepharoplasty.

Dr. Landolt (Paris) presented two cases of blepharoplasty: the first, a tearing of the lower lid from the kick of a horse; the second, an epithelioma of the lower lid. Total ablation of two-thirds of this lid. Blepharoplasty by sliding a vertical flap taken from the cheek and blepharoraphy.

The speaker described a third case in which there was cicatricial destruction of the middle portion of the lower lid and distichiasis.

Diseases of the Eye in Vendée.

Dr. Chevallereau (Paris) gave a résumé of the observations which he had made during the last five years in Vendée on patients of Celtic origin, and pointed out the relative frequency of ocular affections in that region

Diseases of the lachrymal ducts, the lids, the muscles, the cornea, and the choroid are rare; anomalies of refraction are frequent; finally, diseases of the lens, of the vitreous, and glaucoma are very common.

A curious peculiarity in this essentially agricultural country, where great industries are rare, is the great frequency of affections of traumatic origin. Thus, against 63 cases of complete senile cataract of spontaneous origin, I have observed the enormous proportion of 25 traumatic cataracts, among which 23 were caused by pricks from the spines of hedges. In fact, all the fields are separated from each other by thick hedges composed in great part of hawthorn, which form impenetrable barriers to the cattle. Twenty-three of these 25 patients, paysans or hunters, tried, in order to avoid a long détour, to cross through one of these hedges, and thus acquired traumatic cataract.

Another interesting fact is the relative frequency of injuries from the horns of cattle; I have seen five such cases in Vendée during the last five years, and only saw one in Paris in twenty years. In each of these 6 cases the eye was absolutely destroyed by the injury, but this refers only to the eyeball, as the lids were not affected in the least.

Congenital Ophthalmoplegia Externa.

Dr. Guende (Marseilles).—I have seen three cases of congenital hthalmoplegia externa. The first case was that of a girl twenty ars of age with very pronounced double ptosis and almost absolute ation of the eyeballs in the external angles of the lids; there was o myosis without apparent reaction to light; accommodation was rmal. In spite of marked atrophy of the left internal rectus found the course of an operation for musculo-capsular advancement with notomy of the antogonist, I concluded that there was a systematic ion of the posterior nuclei of the third and fourth nerves without rticipation of the subjacent nuclei of the third ventricle.

In this case, as in the two others, where there was complete double hthalmoplegia externa, heredity may be suspected. It was not ssible to find whether the parents had had syphilis.

Dr. Sulzer called attention to the partial persistence of a conver- nt strabismus after complete ophthalmoplegia externa. This phe- menon shows the importance in strabismus of the retraction res so well described by Dr. Parinaud in his report on strabismus oc. française, 1894).

anophthalmitis as the Result of Old Adherent Leucomas.

Dr. A. Terson (Paris).—It is known that panophthalmitis may velop spontaneously in eyes which have had corneal cicatrices for any years with more or less complete strangulation of the iris as e result of spontaneous or operative perforations. These late mplications occur unexpectedly, without being preceded, in the eat majority of cases, by any symptoms of general infection or njunctival or lachrymo-nasal process.

I will briefly describe four cases of this kind. The first, very obably unique, was a patient with Algerian granulations and a uble adherent leucoma of several years' duration. Without ap- eciable cause he developed a spontaneous sub-acute phlegmon in th eyes in one month, which necessitated enucleation. The three her patients also had phlegmon, as the result of adherent leucoma. wo were also treated with immediate enucleation; the third, whose e had already perforated, preserved an excellent prothetic stump ter resection of the anterior segment of the eye.

From the pathogenetic standpoint, these were infections of the e arising from conjunctival microbes which had followed the track the strangulated iris and caused suppuration of the ciliary body hemorrhages in both cases were accompanied with ocular hemorrhages. Mercury had been injected in the form of the oil of the bi-iodide (Prof. Panas' formula).

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Another interesting fact is the relative frequency of injuries from the horns of cattle; I have seen five such cases in Vendée during the last five years, and only saw one in Paris in twenty years. In each of these 6 cases the eye was absolutely destroyed by the injury, but this refers only to the eyeball, as the lids were not affected in the least.

Congenital Ophthalmoplegia Externa.

DR. GUENDE (Marseilles).—I have seen three cases of congenital phthalmoplegia externa. The first case was that of a girl twenty ears of age with very pronounced double ptosis and almost absolute xation of the eyeballs in the external angles of the lids; there was lso myosis without apparent reaction to light; accommodation was ormal. In spite of marked atrophy of the left internal rectus found n the course of an operation for musculo-capsular advancement with enotomy of the antogonist, I concluded that there was a systematic esion of the posterior nuclei of the third and fourth nerves without articipation of the subjacent nuclei of the third ventricle.

In this case, as in the two others, where there was complete double phthalmoplegia externa, heredity may be suspected. It was not ossible to find whether the parents had had syphilis.

Dr. Sulzer called attention to the partial persistence of a converent strabismus after complete ophthalmoplegia externa. This pheomenon shows the importance in strabismus of the retraction bres so well described by Dr. Parinaud in his report on strabismus Soc. française, 1894).

anophthalmitis as the Result of Old Adherent Leucomas.

DR. A. TERSON (Paris).—It is known that panophthalmitis may evelop spontaneously in eyes which have had corneal cicatrices for any years with more or less complete strangulation of the iris as e result of spontaneous or operative perforations. These late mplications occur unexpectedly, without being preceded, in the reat majority of cases, by any symptoms of general infection or njunctival or lachrymo-nasal process.

I will briefly describe four cases of this kind. The first, very robably unique, was a patient with Algerian granulations and a uble adherent leucoma of several years' duration. Without apreciable cause he developed a spontaneous sub-acute phlegmon in th eyes in one month, which necessitated enucleation. The three her patients also had phlegmon, as the result of adherent leucoma. wo were also treated with immediate enucleation; the third, whose e had already perforated, preserved an excellent prothetic stump ter resection of the anterior segment of the eye.

From the pathogenetic standpoint, these were infections of the e arising from conjunctival microbes which had followed the track the strangulated iris and caused suppuration of the ciliary body and of the vitreous humor, as was shown by anatomical preparations There is, then, an ectogenous infection which precedes this complication, and it may be arrested at the onset by cauterizing the external infected point with the actual cautery Sub-conjunctival injections of sublimate are also to be recommended When phlegmon appears, if the eye is not perforated, immediate enucleation should be performed without consecutive sutures ; if it is open, resection of the anterior segment is sufficient

As preventive operations, recourse may be had to synechotomy combined with repeated iridectomies and also iridodialysis, but if the slightest adhesion of the iris persists the phlegmon may appear later.

Retinal Hemorrhages in a Case of Hereditary Hæmophilia.

DR. VIALET (Paris) described a case in which hæmophilia was the cause of hemorrhages into the retina and the vitreous. This man, who was the son and grandson of hæmophilic persons, was troubled during his entire youth with obstinate epistaxis, and at the age of twenty-nine had for the first time a profuse hemorrhage into the vitreous, which led to complete blindness in the right eye. The ophthalmoscope revealed the presence of a large new membrane in the fundus of this eye, fixed at both extremities to the retina, movable in its median portion, and which was displaced with the movements of the eye. The papilla was completely atrophied, and the central vessels were reduced to small filiform branches which stopped at a short distance from the optic nerve.

After an interval of eight years of perfect health this individual had multiple retinal, papillary, peri-papillary, and macular hemorrhages in the left eye. The latter were of peculiar appearance, being in the form of a series of small rounded or oval spots of equal dimension and connected with fine vascular ramifications.

Coincident with these lesions was a diminution of vision, which was reduced to $\frac{4}{10}$ of the normal, and a paracentral scotoma situated under the point of fixation.

Under the influence of proper treatment, absolute rest, milk diet, iodide of potassium, etc., the hemorrhages in the left eye disappeared without leaving a trace ; the scotoma diminished to three quarters its former size, and vision returned to $\frac{8}{10}$ the normal—an improvement almost equivalent to a cure.

A Pocket Campimetre.

DR. WICHERKIEWICZ exhibited an instrument which is a convenient modification of that of Schweigger.

The Subjective Method of Optometry.

Dr. Bull (Paris) attributes the majority of errors committed in the determination of refraction by subjective methods to the fact hat observers have not changed their method of examination since he discovery of astigmatism. Nearly all oculists are still under the nfluence of the old masters. All the books advise determining the egree of myopia by endeavoring to find the weakest concave pherical glass which gives the greatest increase of vision, and for ypermetropia to find the strongest convex spherical glass which llows the patient to see distinctly at a distance.

While this was admissible when astigmatism was unknown, hese two rules are to-day the cause of many errors, because the pherical glass thus found is left in the trial frame before the atient's eye while an attempt is made to determine the astigmatism y questions relative to the dial, the star, or by trying various ylindrical glasses. Dr. Bull showed the error of such a method, for f there is astigmatism, the spherical glass found over-corrects the myopia or under-corrects the hypermetropia, and therefore the atient is disposed to accommodate for one or another set of rays of he dial, and his answers relative to questions about the dial are lusory. It is on account of these confused responses that many bservers have given up the use of the dial. Dr. Bull, however, howed that they were wrong. He recommends the use of the dial n all cases. His method of examination may be thus briefly stated: He corrects or renders emmetropic the least refractive meridian of the ye with a spherical glass, and then the error which remains is always ound under the form of a simple myopic astigmatism which he orrects with a concave cylindrical glass. In this way trials with so many concave and convex glasses are avoided, and the question of nowing whether there is mixed, myopic, or hypermetropic astigmatism never presents itself during the examination.

Deformation of Objects Seen Indirectly.

Dr. Tscherning (Paris) performed a series of von Helmholtz's xperiments, showing that objects seen indirectly undergo a shortenng toward the periphery. Straight lines seen indirectly seem conave toward the point of fixation.

By means of a small artificial eye reproducing as exactly as possible he dimensions of the human eye, Dr. Tscherning has been able to how that the retinal images show exactly the same deformations. They are due to the projection of the image on the surface of the retina, the posterior portion of which approaches more or less to the form of a sphere. The similarity between these deformations and the observations of von Helmholtz is such that there seems to be no doubt that the illusion is due to the deformation of the retinal images, and not to an error of judgment, as has been commonly supposed.

Artificial Illumination of the Ophthalmometer.

Dr. Augieras (Laval) has succeeded in artificially illuminating the model without the disc of Dr. Javal's ophthalmometer. On the lower surface and in the middle of the arm which supports each mire is fixed a shank of copper furnished at its extremity with a portable electric lamp.

Ophthalmotonometric Study.

Dr. Ostwalt (Paris).—The controll experiments to which I have submitted Maklakoff's tonometer on the one hand and Fick's instrument on the other (see *A. von Græfe's Arch.*, Vol. XL., 5 ; *Annales d'Oculistique*, 1895, p. 212) have convinced me that Fick's apparatus is by far the better for absolute measurements. This tonometer has offered, up to the present time, the inconvenience of requiring at least two observers. I have modified it in such a way that it can be employed without an assistant, my instrument being self-registering.

Optical Correction After Cataract Operation.

Dr. Antonelli.—The average of three months for determining the definite astigmatism seems to me quite correct, and the degree of this normal post-operative astigmatism, so to speak, may be calculated as 2.5 or 3 D., after subtracting the corneal astigmatism which existed before the operation. This latter consideration explains why, in statistics, so many cases show an inverse post-operative astigmatism of about 2 D.

For the exact correction of astigmatism after cataract operation the ophthalmometric formula is almost indispensable. In the first place, for the direction to be given to the cylinder, which skiascopy cannot indicate with as much facility and precision ; in the second place, for the strength of the cylinder. In this respect the relations between corneal As. and total As., for post-operative As., are a little different from the ordinary relations given in Javal's formula. The cylinder accepted by the patient is *always weaker*, in spite of the inverse nature of the As., than the degree indicated by the ophthalmometer. This difference may be 0.5 to 1 D. for the ordinary degrees of post-operative As.; it may be stronger *(2 to 2.5* D.) for a post-operative As. of 6 to 8 D.

To avoid the inconvenience that the combination found by the culist will not correspond with the glass cut and fitted by the opti-ian, I have thought of a special box containing five series of lenses, rom + 8 to + 18 D. The first series to be composed of simple pherical glasses, the others of the same numbers combined with ylinders of + 1 to + 4 D.

Massage of the Eye.

Dr. Parenteau (Paris).—Massage of the eye and its adnexa is a herapeutic method which merits investigation, experimentation, and pplication to many diseases.

Performed in a careful manner, so as to cause no traumatism, mas-age may be useful in disturbances of the lids, such as cysts, chala-ions, swellings, etc. In proper ocular affections I consider it too angerous.

Medicated massage has the double advantage of causing ointments r powders introduced between the lids or applied to them to pene-rate the eye more thoroughly and to cause a more rapid disappear-nce of congestion of the eye and its envelopes. It is especially indi-ated in phlyctenular kerato-conjunctivitis, corneal leucomas, iritis, piscleritis, and irido-choroiditis.

Simple massage, that is performed with the fingers or special in-ruments, without medication, is indicated whenever there is uscular alteration of peripheral origin or vascular disturbances.

Massage is, however, contra-indicated in the following cases: rong progressive myopia, considerable hypotonia, and commencing ns opacities.

Dr. Grandclément.—I employ ocular massage in interstitial kerati-s. With this treatment I obtain recovery in fifty to a hundred ays.

Dr. Sulzer.—East Indians make frequent use of massage, and ob-in very good results from it. They use very light frictions, and equently perform massage with the tongue across the lids.

reatment of Conjunctivitis by Prolonged Sub-Palpebral Irrigations.

Dr. Vacher (Orléans).—Sub-palpebral injections by means of glass canula with an olive-shaped termination are very simple and the disposal of all. They render important service in the treat-ent of conjunctivitis in disembarrassing the cul-de-sac of purulent secretions. They should not, however, constitute the exclusive treatment of conjunctivitis.

At the beginning of conjunctivitis warm irrigations are preferable. I employ them at 40 and 41°.

Cool and very cold irrigations act better in the period of decline.

To avoid corneal lesions, and to allow a large quantity of fluid to be passed, it is better to use weak solutions.

I have tried nitrate of silver $\frac{1}{1000}$, $\frac{1}{5000}$, permanganate $\frac{1}{1000}$, $\frac{1}{2000}$, $\frac{1}{3000}$, sublimate $\frac{1}{5000}$, $\frac{1}{10000}$, cyanide of mercury, pheno-salyl, and carbonate of soda, followed by antiseptic irrigation. In acute iritis I use very weak solutions of atropine or decoction of belladonna leaves. The patients experience a real advantage.

Dr. Abadie.—When we are treating commencing ophthalmia, whatever it be, even purulent ophthalmia, it is possible that irrigations with any solution whatever will be efficacious: with permanganate of potash, weak solutions of nitrate of silver, naphthol, etc. I concede the claims of the partisans of these solutions and washes that may be employed at the beginning of ophthalmias, for at that time we do not know what will be its clinical progress, and have no means of knowing whether it will be serious or not.

In these cases bacteriological examination is only a feeble aid in deciding on the prognosis. In purulent ophthalmia it was supposed that the gonococcus was met with only in the purulent form, but it seems now that it also occurs in the benign form.

This method of diagnosis is therefore insufficient. I lately read an account of a discussion on this subject at the Medical Society of Lyons in which it was stated: "As soon as gonococci are found, employ cauterization; if they are not found, employ irrigation, and that will be sufficient."

But the question is not so simple. When an ophthalmia, either diphtheritic or purulent, is commencing, we are not informed by bacteriological examination as to its future clinical course, and are obliged to rely on the old classical symptoms, which alone will inform us of its gravity.

Therefore, in the beginning, when you have a purulent ophthalmia to treat, try irrigation; it is good, and I grant that this ophthalmia, which otherwise might become very serious, may be modified in a favorable way. But what I cannot grant is, that when the disease is well confirmed and established, when it has become serious, and when corneal applications threaten, these irrigations should be continued exclusively, without recourse to cauterizations with nitrate of silver; it is then that you will lose corneæ and eyes.

It is understood, then, that we are in accord as to the use of irrigation in the beginning, but only in the beginning, and that the partisans of these irrigations should not claim that these solutions cure when the disease is well established.

Drs. Chibret and *Teillais* consider nitrate of silver as a sure method of treatment in conjunctivitis, and that no other form of treatment should be substituted for it in severe cases.

Dr. Galezowski insists on the necessity of making two cauterizations of nitrate of silver daily in treating ophthalmia.

Anterior Synechias and Synechotomy.

DR. GAUPILLAT (Troyes) favors interference in all cases of synechia, even when they are uncomplicated, whenever the synechia is central enough for the performance of synechotomy.

He calls attention to the æsthetic side of the operation, for, unless informed of it, it would never be perceived that an anterior synechia had existed. The speaker regrets that synechotomy, as performed by Desmarres, has fallen into disuse.

Dr. Despagnet says that this operation should be preserved, and that in reality it is as he has seen Dr. Galezowski perform it.

Methodic Curetting of the Cornea in the Treatment of Pterygium.

DR. DESCHAMPS (Grenoble).—In several cases of pterygium I have employed vigorous curetting of the denuded corneal surface after carefully detaching and excising the membrane. I have used a small curette, commonly employed for curetting corneal ulcers. This curetting removes all the enclosed débris from the surface of the cornea. It disinfects the wound in a perfect manner, and prevents recurrence. It should be substituted for the galvano-cautery, which is a blind method, and which produces a useless superficial scar.

I then perform simple conjunctival autoplasty only by sliding the flap, a few snips of the scissors freeing, if necessary, the portions which are too tense and drawn by the sutures.

A New Type of Paralysis Associated with Horizontal Movements of the Eye.

DR. SAUVINEAU (Paris).—Until lately we have classified all ocular paralyses under the old headings of paralyses of the third, fourth, and sixth pairs of cranial nerves. At the present time a large number of cases difficult to understand are classified as ophthalmoplegias.

There exist, however, certain paralyses which are neither isolated palsies of one of the three cranial nerves which are distributed to the muscles of the eye, nor are they ophthalmoplegias: these are the palsies of association. These paralyses affect the muscles, which produce similar movements in both eyes. It is the movements of the eyes which it is important to consider, and not the paralysis of this or that isolated muscle. A muscle may, perhaps, be paralyzed for a certain movement and retain its action for all others.

Among the paralyses of movement (horizontal movements, vertical movements, movements of convergence and divergence) the movements from side to side are the most interesting to study, for the explanation of movements of association, the same movement in two muscles (external rectus on one side and internal rectus on the other), supplied by different nerves, has for a long time exercised physiologists. This is the variety of paralysis still not observed which is mentioned here.

Just here I would describe two types of paralysis of side to side movements. The first was noticed by Foville (1858), and more especially by Féréol and Groux. These authors have shown that a lesion of the *eminentia teres*—that is to say, of the nucleus of the sixth pair—causes a paralysis of the external rectus of the corresponding side, and of the internal rectus of the opposite side.

The interpretation of this fact has been given by Drs. Duval and Laborde, who have established that the nucleus of the sixth pair sends anastomosing fibres to the internal rectus of the opposite side, fibres which serve to associate the internal rectus with the external rectus of the opposite side in the same lateral movements, while for movements of convergence this same internal rectus receives special enervation from the nucleus of the third pair.

The second type has been described by Dr. Parinaud. It consists in a paralysis of the external rectus of one eye, while the internal rectus of the other eye not only is not paralyzed, but, on the contrary, is in a state of spasm more or less pronounced. The lesion is situated in this case beneath the nucleus of the sixth pair in the course of the nerve to the external rectus.

I have observed a third type, clearly marked, which is exactly the reverse of the preceding. It is the internal rectus of one eye which is paralyzed (for lateral movements only, the movement of convergence remaining intact), while the external rectus of the other eye is the site of spasm. The lesion seems to be situated in the medulla in the course of the anastomosing fibres going from the nucleus of the sixth pair to the internal rectus of the opposite side.

The Pneumococcus in Ocular Pathology.

DR. CUÉNOD (Paris) said that he had found the pneumococcus as a cause in certain mild, and also in certain grave, ulcerations of the cornea. His researches upon the catarrhal inflammations of the lachrymal sac had demonstrated to him the frequent presence of these bacteria in these affections.

A case of panophthalmitis and adherent leucoma accompanied with inflammation of the lachrymal sac showed the presence of pneumococci in great abundance in the pus from the eye and the mucus from the lachrymal sac. In another case of panophthalmitis, in which a sympathetic irido-cyclitis had developed, the existence of the pneumococcus was also demonstrated by inoculation of mice.

The pneumococcus, found normally in the upper respiratory tracts, sets up disturbances of the eye from without in the conjunctiva and cornea, but also by infection from within in the orbit and the deeper tissues of the eye. In external infection the lachrymal ducts seem to be the way by which infection ascends from the more or less latent infection in the nose.

Superficial Cauterization of the Cornea with the Actual Cautery in Cases of Infiltration Following Purulent Ophthalmia.

DR. SUREAU (Paris) recommends, as a last resort, where, in spite of treatment for purulent ophthalmia in the new-born, the cornea is infiltrated, softened, and disintegrated, actual cauterization superficially applied over the whole corneal field. In two unfortunate cases, treated as hopeless, the result has surpassed all that could have been foreseen.

Permanganate of Potash in Ocular Practice.

DR. VIAN (Toulon) uses in the septic affections of the eye and its adnexa a concentrated solution of permanganate of potassium.

He cites two cases of purulent ophthalmia cured by daily application with a brush of a 10% solution of permanganate, and by bathing with the same in solution $\frac{1}{2000}$. The first was a man, seventy years old, who presented the following symptoms : the lower lid had been eaten away by a cancerous ulcer ; the upper lid completely covered the eye, and it was impossible to invert it, so that in cauterizing the upper lid the cornea was touched and turned a decided brown color. For three days the treatment with permanganate of potassium was suspended, and replaced by cauterization with nitrate of silver. The cornea, which up to that time had remained intact, became infiltrated and commenced to soften. The following day, after the use of permanganate was resumed, the cornea had recovered its resistance, and twenty days after had become completely transparent.

The second case, a child of twenty-five days, was cured by a 10% solution.

In the treatment of abscess and purulent catarrh of the lachrymal tract the author has employed daily injections of a 10% solution of permanganate of potassium ; he has obtained very rapid cures in all the cases.

Dr. Vian has also used a 2% solution of permanganate of potassium in infectious keratitis without hypopyon, but the result has not been conclusive.

On the Ocular Complications of Diabetes.

Dr. Koenig (Paris).—Diabetes causes numerous disturbances of the visual apparatus. The most frequent are weakness of accommodation, sometimes paralysis, and opacities of the lens. In 500 cases which I have examined at Vichy I have found 56 cases of eye trouble—about 11%. In this number there were 10 *cataracts*. Among the other principal lesions I found 20 cases of disturbance of *accommodation*, 2 cases of hemorrhagic glaucoma, one of which was followed by death, 2 cases of *gangrene* of the lids, and 2 cases of chronic *general encephalitis* of the convexity, one followed by death at the end of two months. The diabetic cataract is usually soft and milky in appearance, but in old people it resembles the ordinary senile cataract. Among the complications which follow operations I have observed œdema of the lids and peri-orbital neuralgia.

The *retinitis of glycosuria* is characterized by the presence of little apoplexies and of some white exudation. The predominance of this last, and its occurrence in the region of the macula, indicate the presence of albumin in the urine. Differentiation between these two forms of retinitis is, then, impossible. This statement has great importance from a prognostic point of view. If the optic nerve is involved, it becomes discolored, and simply undergoes white atrophy without œdema. Two of my patients having atrophy of the optic nerve presented these interesting peculiarities: the first, aged fifty-four years, had a brother who was blind as the result of atrophy; the second, aged six years, passed 57.2 gr. of sugar per litre.

Operative Asepsis; Instruments and Dressings.

DR. DESPAGNET (Paris) exhibited a hot bath for sterilization which accomplishes at the same time sterilization in boiling water and in dry air at 180°. Superheated steam under pressure heats the upper apartments used for the dressings, while the instruments are sterilized in the lower compartment in the boiling water.

Dr. Jocqs does not think that it is necessary to practise as strict asepsis in operations on the eye as in abdominal operations.

Dr. Chibret.—These hot baths are complicated and costly instruments. Dry heat gives no security. It is very much better to use cyanide of mercury in solution, which enables us to realize the disinfection of instruments in a practical and economical manner.

Dr. Morax.—The reproach cast by Dr. Chibret on the procedure of sterilization by dry heat forces me to enter a protest. This procedure, the efficiency of which it is not necessary to demonstrate, is in constant use in the laboratories. It has great advantages; it does not oxidize the instruments, and it does not alter the edge; it is absolutely efficacious. The only inconvenience consists in the difficulty which one encounters to obtain a sterilization in air of uniformly the same temperature; this ought not to exceed 180°. The oscillations from 180° to 220° or higher may alter the instruments. In order to give more stability to the temperature, and to cause an equal distribution of the temperature as far as possible, I have had constructed, by Mr. Major, a hot-air sterilizer, the double walls of which contain sand, and the interior wall is closed by a metallic covering, a poor conductor of heat.

When one has obtained an interior temperature of 170° the gas which is used for the heating can be turned off. The interior temperature is maintained, thanks to the sand, during twenty minutes, near 170°, without being again heated.

Dr. Vacher.—I am accustomed to use chloroform for the sterilization of instruments. It is a very practical way.

Dr. Galezowski.—We give so much importance to the sterilization of instruments; it appears to me more important to sterilize the surrounding air.

Bacteriological Research in Empyemas of the Lachrymal Sac.

DR. MAZET.—To avoid, as far as possible, causes of error arising from the conjunctiva or the nasal fossæ, one should examine only the lachrymal suppurative product free from all contamination. In all cases the pus should be collected from the centre of the sac by an external puncture through the skin.

The affections designated by the names of phlegmonous dachryocystitis, inflamed lachrymal tumor, and lachrymal tumor are only varieties of empyema of the sac.

These empyemas may now be grouped under two principal classes:

1st. Acute phlegmonous empyema.

2d. Sub-acute encysted empyema.

Acute phlegmonous empyema results from infection caused either by streptococci or colibacilli.

Encysted empyema is the result of infection from the staphylococcus most frequently, or from some pathogenic bacillus.

These microbes are very frequently associated with various saprophytic bacteria.

Further researches, performed under the same conditions, will show whether other microbes are instrumental in the pathogenesis of empyemas of the sac. They may also enlighten us as to the frequency with which a sub-acute empyema is transformed into a phlegmonous empyema under the influence of secondary infection.

Enlargement of the Erect Ophthalmoscopic Image in Ametropia.

DR. VIGNES (Paris).—*Emmetropia.*—By likening the ocular optic system to a lens, the enlargement of the visual ophthalmoscopic image is obtained by the well-known formula—

$$G = \frac{-(D - d)}{g''} \qquad (1)$$

in which D is the distance of the examiner's eye from the visual image, d that which separates the eyes of the examiner and the examined, g'' the distance of the second nodal point from the retina.

Ametropia.—Giraud-Teulon (Academy of Sciences, 1869) showed that the retinal images of emmetropia and ametropia are of the same size, on condition that the correcting glass coincides with the anterior focal plane of the ametrope. In this case the second nodal point is displaced by an amount equal to the distance which separates the retina from the second principal focus.

If it were possible to give this position to the correcting glass in making an ophthalmoscopic examination, the enlargement of the ophthalmoscopic image would be the same in ametropia and emmetropia; there would be no reason for going further.

But in practice, as the ophthalmoscope is applied before the examiner's eye, the correcting glass is always at a greater distance from the examined eye than the length of the anterior focal distance. Then the second nodal point is still displaced from the point where the correcting lens, placed at φ', had brought it by a quantity x proportional—for an invariable distance—to the strength of the lens used.

The formula (1) becomes

$$G = \frac{-(D-d)}{g'' \pm x} \qquad (2)$$

and shows that the enlargement in the ametropic eye diminishes with the increase of x and increases inversely.

If it is observed that in the combined system (eye and lens of the ophthalmoscope) $g'' \pm x$ is the distance of the second nodal point from the retina, a quantity equal to the first principal focal distance, the formula

$$\Phi, = \frac{f''\ \varphi''}{(f'' + \varphi') - d} \ .$$

furnishes all the facts required for a knowledge of the enlargement of an ametropic eye corrected with a lens of focus f'', and placed at a distance x from φ.

Numerical examples:

1st. Emmetropia. $G = \dfrac{-(D-d)}{g''} = \dfrac{300-30}{15} = 18$

2d. Ametropia corrected by a lens of 100 millimetres focal distance (f'',) distant 15 millimetres from the principal anterior focus of the eye (φ').

$G = \dfrac{-(D-d)}{g''+x} = \dfrac{300-30}{23.5} = 11.8$ when x is positive—that is, a hypermetropic eye of about 11.7 dioptres.

$G\ \underline{Am} = \dfrac{(D-d)}{g-x} = \dfrac{300-30}{8.5} = 301$ when x is negative, and there is myopia *of 8.36 dioptres.*

Irrigating Apparatus for the Eye.

Dr. Dariex (Paris).—Aspiration is produced by a tube and canula analogous to those of Redard's apparatus. For irrigation, propulsion of the fluid is obtained by a small elastic rubber sac fixed to the apparatus, and which is easily filled with an ordinary syringe by means of a slight adjustment. The irrigating current is regulated by a small cock placed at the entrance of the pouch, and which is manipulated by a slight movement of the finger.

SOCIETIES

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM

Session of May 2, 1895.

A New Operation for Ptosis.

Mr. Mules has already described this operation at the last International Ophthalmological Congress, held at Edinburgh in August, 1894.

The principle of the operation consists in the substitution of the frontal muscle for the elevator of the upper lid by fixing the first muscle to the border of the lid by a permanent metallic suture. Of all the metals experimented with, silver has given the best results.

Mr. Argyll Robertson heartily approves of the principle of the operation, but fears that the presence of the silver wire would produce too much palpebral irritation if left in place for any considerable time. In his opinion, there is as yet no perfect operation for ptosis.

Blood Spots on the Cornea.

Mr. Treacher Collins has observed spots on the cornea of a greenish-red color, due to the presence of refractive granules scattered through the stroma of the cornea.

The seat of these granules was not determined, and had no definite relation with the spaces between the lamellæ of the cornea. Spectroscopic study and chemical reactions led to the belief that they were composed of hæmatoidin.

In some cases, there was associated with hæmatoidin a substance which, on chemical examination, showed the presence of iron; this was, without doubt, hæmosiderin.

In eyes thus affected, the ocular tension was generally increased, and the escape of fluids from the angle of the anterior chamber was hindered by an accumulation of blood corpuscles. Primarily, there must have been a simple diffusion of hæmoglobin into the cornea through the membrane of Descemet, and the hæmatoidin, which is insoluble in the corneal fluids, was thus precipitated. At that time the entire cornea was invaded by the process, and it was difficult to distinguish this condition from a total hypohæmia.

The absorption of the hæmatoidin granules commenced at the periphery and extended in all directions, so that at that time there was a narrow, clear corneal coronna. The appearance was, then, that of a lens dislocated into the anterior chamber. The discoloration continued afterwards.

Mr. Jessop has recently seen a case in which, after an injury, the anterior chamber was completely filled with blood. The cornea also contained blood in its interior. In three days all had disappeared.

Mr. Collins thinks this case altogether different. In his opinion, this was simply a diffusion of the coloring substance of the blood through the proper corneal substance.

A Grave Hemorrhage of the Surface of the Palpebral Conjunctiva of Sudden Occurrence.

MR. JESSOP treated a woman, twenty-seven years of age, who was brought to St. Bartholomew's Hospital in a condition of serious collapse, due to repeated hemorrhages in the left eye. The pulse was 130, small, irregular, and the number of pulsations difficult to count. The extremities were cold, and the right pupil dilated.

On everting the left lid, a small ulcer was found with festooned edges, 1½ millim. in diameter, situated in the middle of the palpebral conjunctiva, and from which there was an abundant flow of clear arterial blood. The ulcer was cauterized and cold compresses applied. With the exception of a slight recurrence, the blood-flow was completely stopped.

Fourteen years before, the patient had had erysipelas of the left eye and nose, and since that time the left lid had always been slightly swollen. This young woman had never had hemorrhagia, and nothing in her past history suggested hæmophilia.

She had been married for one year, and was seven months pregnant.

This was, then, without doubt, an aberrant and unknown nævus. There is no such case in literature.

Mr. Stephenson had seen a severe conjunctival hemorrhage occur from time to time in a girl eleven years of age with trachoma, who had been operated upon *by expression*. This hemorrhage continued for more than five months.

The child was frequently examined at the commencement of the hemorrhage, and it could never be discovered in her case where was the point of escape of the blood. The conjunctiva was uniformly red and turgid.

There was no trace of anæmia, purpura, or scorbutus, and the idea of hæmophilia seemed impossible, since extraction of a pre-molar had not been followed by excessive hemorrhage. At this same time there was swelling of the knee joints, which was renewed three times, but only lasted a few days.

III.—REVIEWS OF OPHTHALMOLOGICAL JOURNALS

Beitrage zur Augenheilkunde

Reviewed by Dr. Van den Bergh.

I.—Education of the Sight in an Intelligent Person Twenty-six Years Old Who Was Born Blind, by Dr. Francke, Assistant at the Ophthalmological Clinic of Greifswald.

The patient, who had double congenital cataract with pronounced nystagmus, was examined and interrogated with care before the operation. He remembered that in his infancy he had taken part in the games of his age, and that he had played with trumpets, drums, and guns. Later, he entered an institute for blind children, and there learned to read, to calculate, and to sing.

His touch was of incomparable fineness, and by means of this sense he had acquired a very exact conception of the form of objects. Although he could not count fingers, he could determine the linear dimensions of objects brought quite close to his eyes from the shadow which they threw. He also had an idea of distance, which was easily verified with the flame of a lamp. He simply calculated the distance somewhat short, and made the same mistake in the same proportion when he tried to determine the length of a stick after touching it.

The patient was operated on December 20, 1893, by Professor Schirmer, and had a relatively feeble visual acuity, only counting fingers at first very near by, and later, at the end of four months, at 30 centimetres.

The author compares the progress of the education of sight in his patient by that observed by Drs. V. Hippel, Hirschberg, and Uhthoff in children from four to seven years of age operated upon by them. There is one fact to be noticed : the children all had a higher visual acuity, a circumstance due, probably, to the lateness of operative interference in Francke's adult. But, in spite of the inferiority of vision, this patient progressed much more rapidly than the children, on account of his facility in learning and retaining the names of objects. At first he did not recognize by sight objects which he knew by touch, but it was sufficient to name them to him a single time for him to easily remember them in future experiments.

The children required a longer time. One experiment is very curious. When a mirror was given to the patient for the first time, he said, "I think that it is an image;" then afterwards, "I think it is a mirror," and then he was immediately conscious that the image before him was his own. In the case operated upon by Uhthoff, a boy seven years of age, whose vision was such that he could recognize at 3 metres a piece of paper 2 centimetres square, it was necessary to show him the mirror several times before he learned to recognize it, and it required still more trouble to teach him that the mirror reflected his own image. Four weeks of daily prolonged experiment hardly succeeded in inculcating this idea. Another peculiarity worthy of remark is that when either a doll or a photograph was shown to the children it was clear that they did not take into consideration the reduced dimensions under which the human figure was presented to them. When they were asked to put the finger first on the hair and then on the mouth of the reproduction, they marked a distance as if it had been a figure of natural size. The author's patient, on the contrary, was able to account exactly for the reduction.

The influence of intelligence and reasoning on the education of sight is clearly seen from these examples.

Contrary to V. Hippel, Chesselden, Wardrop, Franz, and the majority of authors, who claim as an established fact the initial absence of the sense of depth, the author is convinced that in his patient this sense existed in a manifest degree. Perhaps the vague notions which the patient had acquired on this subject before the operation were a great aid to him.

One peculiarity which the author's patient had in common with the majority of similar cases was the difficulty in recognizing the relief of objects. Thus, for a long time he confounded a true egg with an oval figure of equal dimensions placed on paper.

Even at the end of six months he could not tell which was the greater of two objects, of different dimensions, but unequally separated from the eye, so as to fall on the retina with the same visual angle. The author's case differed in this respect from Uhthoff's case. Uhthoff's child could make this distinction with both eyes, but made mistakes with one eye alone.

II.—**Historical and Experimental Studies of the Origin of Myopia,** by Dr. Ascher (Frankfort).

The author considers the history of this question. Until the time of von Arlt, who was the first to notice the elongation of the optical axis as anatomical cause of myopia, the author tells us nothing which is not contained in the classic treatise of Donders. I should, however, mention this fact, not mentioned by Donders, which is that Aristotle asks, "Why do myopes press the lids together?" and, which is more suggestive, "Why have they a small handwriting?"

The author also tells us that, according to Mauthner, Leonardo da Vinci knew of the dark chamber a long time before Porta.

He also brings to mind the forgotten fact that Guérin (Lyons), in his treatise on diseases of the eye (1769), gives as cause of myopia a "weakening" of the posterior pole of the eye and elongation of the optical axis due to ectasias.

Turning then to the origin of myopia, Ascher states that from antiquity until the present day the application of the eyes at short distances has continued to be regarded as the determining cause of the anomaly. But opinion is no longer unanimous as to the mechanism which explains why near vision will provoke elongation of the optical axis.

The three current theories, that of convergence, that of accommodation, and that of compression by the superior oblique (Stilling's theory), are then reviewed. The author considers the criticisms of these theories. He thinks that neither the one nor the other of these three theories is to be rejected. All are defendable, but none has reached the height of a truly scientific theory.

The author had hoped to be able to shed some light on these disputed questions by experimenting on young rabbits, with the aim of comparing the influence of strong convergence and that of prolonged spasm of the accommodation. For this purpose, he operated upon the eye in some, making an exaggerated convergence by advancement with shortening of the internal rectus, and in others by producing an exaggerated tension of accommodation by instillation of pilocarpine. These experiments, performed with the greatest care, produced no result. Although the animals were in process of growth, the eye experimented upon did not elongate any more than its mate, which played the rôle of witness.

The author was not able to experiment on the effect produced by an exaggerated pressure on the eyeball from the superior oblique. But he is convinced that if the lateral pressure exercised by the recti muscles in the experiment performed by him had no influence on elongation of the optical axis, transverse pressure from the superior oblique would have no more effect.

In conclusion, the author's experiments, without in the least advancing the question, have put one more weapon in the hands of the adversaries of the three current theories.

III.—A Case of Traumatic Ophthalmoplegia with Recovery,

by Dr. Vossius.

A youth, seventeen years old, inadvertently received a cut from a foil without a button. The skin ½ centimetre below the lower left orbital border was cut to the extent of 1 centimetre. The wound was superficial, and did not extend beyond the skin. There was diffusion of blood in the lower cul-de-sac and pain on pressure over the trochlea.

In spite of the benign appearance of the injury, there was ptosis of the upper lid; the eyeball, without protruding, was immovable, with the exception of a slight outward movement; accommodation was completely paralyzed; the pupil was dilated and without reaction; diminution of vision in the right as well as in the left eye.

Nothing was found on ophthalmoscopic examination.

How is this ophthalmoplegia to be explained? The cause was necessarily peripheral, acting by compression on the trunks of the ocular nerves. Two suppositions are possible: either the symptoms of compression were due to simple intra-orbital blood effusions or to a fracture of the orbital vault with displacement of the fragments.

The absence of protrusion of the eyeball is against the first supposition. As for the second, it seems much more probable, since at the time of the accident the patient had fallen into a faint, had vomited, and had a sub-conjunctival effusion of blood, which, under the circumstances, might have a special significance.

The diagnosis was, however, reserved.

Recovery was slow, but progressive.

At the end of a month and a half improvement was such that the young man was able to return home.

He returned about six months after the accident. Vision in both relief of objects. Thus, for a long time he confounded a true egg with an oval figure of equal dimensions placed on paper.

Even at the end of six months he could not tell which was the greater of two objects, of different dimensions, but unequally separated from the eye, so as to fall on the retina with the same visual angle. The author's case differed in this respect from Uhthoff's case. Uhthoff's child could make this distinction with both eyes, but made mistakes with one eye alone.

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The diagnosis was, however, reserved.

Recovery was slow, but progressive.

At the end of a month and a half improvement was such that the young man was able to return home.

He returned about six months after the accident. Vision in both eyes had become normal, and the ophthalmoplegia had left no other traces than a very slight paresis of the superior rectus and a slight mydriasis and paresis of accommodation.

From the total disappearance of the paralytic symptoms, the author concludes that there was a fracture of the orbit without displacement of the fragments, and that the compression on the two optic nerves and the left temporal ophthalmoplegia is explained by a slight hemorrhage into the osseous canals which contain the nerve trunks.

IV.—**Unusual Ophthalmological Cases**, by DR. AHLSTRÖM (Gothenburg).

1. *Traumatic Aniridia with Integrity of the Lens.*—Rupture of the sclera situated above and slightly below, about 2 millimetres from the sclero-corneal border, extending to a quarter of the corneal circumference, and caused by a blow of the fist. Total absence of the iris, not the least trace of which remained in the wound. Recovery with integrity of the lens. Normal vision. The author has been able, in the eye of this patient, to study the manner in which the ciliary processes act. Neither before nor during accommodation do they touch the border of the lens. During accommodation they advance, pressing against each other. An instillation of atropine causes them to retract back of the position which they occupy in relaxation of the accommodation, an evident proof that even in a condition of repose of the eye the ciliary muscle is in a state of relative contraction.

The author then reviews the theories of von Arlt, Zehender, Manz, and Hughes on the origin of scleral ruptures, and discusses the points in which his case supports one or the other of these theories.

He also endeavors to explain the way in which the injury produced total iridodialysis.

2. *Double Congenital Ptosis with Immobility of the Eyeball.*—A young man of fifteen years. Accommodation and pupillary reaction intact. There was then external congenital ophthalmoplegia.

The author concludes that the anomaly was due to an arrest of muscular development rather than to a nuclear lesion.

The ptosis was operated upon successfully by Birnbacher's method.

3. *Tumor of the Optic Nerve.*—Myxo-sarcoma in a girl twelve years of age. Enucleation of the eyeball with extirpation of the nerve at the optic foramen.

Centralblatt für Praktische Augenheilkunde

Reviewed by Dr. V. MORAX.

January.

I.—A Piece of Copper Fixed in the Retina for Ten Years; Considerations on Impregnation of the Retina with Copper, by Dr. W. GOLDZIEHER.

A youth of eighteen years came for consultation on account of myopia. Goldzieher found in the right eye a slight opacity of the anterior surface of the lens, situated in the pupillary field, and a limited disturbance of the corresponding portions of the lens. The iris and the cornea were normal. When the eye was illuminated with a brilliant light a peculiar metallic reflex could be seen with the naked eye. With the ophthalmoscope some punctiform opacities of the vitreous were seen, which, however, did not prevent exploration of the fundus of the eye; the disc and the vessels were normal. Somewhat outside of the macular region, orange or reddish spots were seen, of small size, situated in the superior layers of the retina; there were, however, no pigmentary modifications, and the choroid had not been altered. In the centre of the retinal zone, thus altered, appeared a foreign body with a metallic reflex projecting from the retina. Vision was $\frac{20}{30}$ after correction of myopia of 2 D. The patient remembered that ten years before he had received an injury from a gun-cap which had necessitated medical treatment for some time.

This is one more case in support of Leber's theory, which is that fragments of copper do not cause sympathetic ophthalmia unless they are septic. In this case, the metallic reflex in the fundus of the eye, when the pupil was dilated, was due to an impregnation of the retina with copper, but there has as yet been no histological study of such cases.

Goldzieher discusses the nature of the chemical process which caused this special reflex. Is there a deposit of oxide or of reduced copper? Experiment alone can solve this question.

II.—A Case of Melanotic Sarcoma of the Ciliary Body, by Drs. J. HIRSCHBERG and A. BIRNBACHER.

A woman fifty-nine years old had in the lower portion of the anterior chamber a brown mass which had pushed the insertion of the iris upward. In this case, as in the cases of Iwanoff, von Græfe, and Hirschberg—that is to say, in all the published cases of sarcoma of the ciliary bodies—the new formation exhibited itself by detaching the circumference of the iris and the corresponding deformation of the pupil.

Histologically, this was a sarcoma of mixed cells (round and fusiform) with pigment granules free or in the protoplasm of the cells. The tumor seemed to be developed between the middle and internal layers of the choroid.

III.—Paralysis of the Abducens with Pneumonia,
by Dr. C. H. Westhoff.

A child two years and a half old, with pneumonia in the left apex, presented, three days after the commencement of the pulmonary affection, a total paralysis of the sixth nerve of the right eye, which recovered spontaneously in three weeks. The paralysis was greater at the time when the pulmonary affection was in its acme, and improvement progressed in proportion to the reabsorption of the pulmonary exudate. The author compares this case to diphtheritic paralysis, and thinks that the lesion was caused by a toxine.

I am rather inclined to think that this was a manifestation of meningitis, since meningeal localization is a fact of frequent occurrence, especially in pneumonia of the apex; and besides, these meningeal lesions from the pneumococcus may recover in a perfect manner.

IV.—Tattooing of the Cornea to Improve Vision, by Dr. O. Landau.

In a case of central leucoma vision was markedly improved by a simple tattooing of the leucoma.

February.

I.—On a Case of Double Paresis of the Sixth Nerve Following Diphtheria without Other Ocular Disturbances, by Dr. Bloch.

A child seven years of age, three weeks after the commencement of a rhino-pharyngeal diphtheria, developed paralysis of the velum palati, which lasted for about one month. One week after the recovery of the paralysis of the velum palati, diplopia suddenly appeared, with vertigo and deviation of the eyeballs. Examination proved the absence of pupillary and accommodative disturbances, and the existence of an alternating, converging strabismus with homonymous diplopia. On looking to the right, fixation was made with the left eye, and reciprocally. This double paresis with strabismic deviation lasted for fifteen days, and then the strabismus disappeared, and diplopia only remained on looking obliquely. The peculiarity of this case was the absence of paralysis of accommodation.

In seventeen cases of paralysis of the sixth nerve following diphtheria, seen at Hirschberg's clinic, Bloch has found five cases of paralysis of both external recti associated with double paralysis of accommodation, six cases of paralysis of one external rectus with double accommodative paralysis, one case of unilateral paralysis of the external rectus and of the accommodation, two cases of paralysis of the external recti without accommodative paralysis, but this had existed before the diphtheria. Finally, three cases of paralysis of the external rectus alone, in two of which the paralysis was bilateral.

II.—Aspiration of a Traumatic Cataract with Successful Results, by Dr. O. Landau.

An opacification of the lens developed in a man twenty years of age after an injury with penetrating wound of the cornea. Ten days after the injury, increase of intra-ocular tension necessitated interference. Paracentesis was performed with a lance-shaped knife, the capsule was opened with capsule forceps, and a small portion of the cortical masses removed; but after this interference the reabsorption was not fast enough, and the paracentesis was repeated, and this time aspiration of the crystalline substance was made with Teale's aspirator. Perfect recovery without reaction.

March.

I.—Irritation of the Eye; Three Reflexes Caused by Irritation of the Trigeminus, by Dr. A. Moll.

In almost every active inflammation of the anterior portion of the eyeball several symptoms are observed which we call "irritation of the eye," and which are characterized by contraction of the pupil, lachrymal hypersecretion, and contraction of the lids. It is the first branch of the trigeminus which transmits the centripetal excitations to the nerve centres. What is the centrifugal route? If we first consider the lachrymal reflex, it will be found that certain authors consider the lachrymal branch of the trigeminus as the secretory nerve of the lachrymal gland, and make this function dependent on the fifth nerve. Brücke, and afterwards Reich, disagreed with this theory. More recently, Goldzieher has endeavored to show that the secretory fibres come from the facial. These fibres reach to the lachrymal gland either by the malar nerve anastomosing sub-cutaneously with the spheno-palatine ganglion, and consequently in relation with the great superficial petrosal, or by recurrent fibres from the *corda tympani.* Uhthoff and Jendrassik have reported cases in which after a complete facial paralysis tears were only produced on the non-paralyzed side. But experimental physiological demonstration has yet to be made. Neither do we know the position of the secretory centre, which, according to Exner, is situated in the neighborhood of the calamus. Blepharospasm is also a reflex phenomenon, whose centripetal route is by the first branch of the trigeminus, and the centrifugal route by the orbicular branch of the facial. As for what Donders has described as sympathetic blepharospasm (occurring in one eye when the other eye has irido-cyclitis), it may be explained by the law of symmetrical reflexes.

As for pupillary contraction following irritation of the trigeminus, opinions are various, as they also are on the question of enervation of the iris. Some claim that the common oculo-motor alone acts on the pupil, others that the trigeminus and oculo-motor both send fibres to the iris.

But these two theories may be reconciled by granting that fibres from the trigeminus join with vaso-motor fibres for the vessels of the iris. Irritation of the sensory centripetal fibres of the trigeminus will be transformed, in a centre whose position remains to be determined, into a centrifugal stimulation of the vaso-motor. Clinical and experimental facts accord perfectly with this hypothesis.

II.—**Cortical Cataract,** by Dr. J. HIRSCHBERG.

From 1871 to 1873, Hirschberg operated on 168 eyes in 99 patients for cortical cataract. Of this number not one eye was lost. In the presence of a cortical cataract there is choice between three different methods: First, by doing nothing; abstention is more important than is supposed, and when vision is ½ or ⅓ Hirschberg always advises against interference. Second, iridectomy; this is only useful in case of pupillary occlusion, and its value has been much exaggerated. Vision is rarely improved by iridectomy; and, besides, many children with cortical cataract are myopic, so that it is better to remove the lens. Third, discission or extraction of the lens; discission gives very good results, and vision is much better after flap extraction. Hirschberg only performs flap extraction if his patients are over twenty years of age. It is exceptional to see increase of tension develop after discission. In this case it is sufficient to make an incision with a lance-shaped knife and evacuate a portion of the lens mass.

III.—**On Sympathetic Ophthalmia,** by Dr. J. HIRSCHBERG.

The fundus of the eye in sympathetic ophthalmia has a special appearance. There are clear spots in the periphery of the retina, which have a great analogy to specific lesions, and which reproduce more or less exactly the lesions in the injured eye. If it is considered that anatomical examination of the injured eye shows lesions quite similar to those of tuberculosis (giant cells and granulation tissue), it may be supposed that the cause of sympathetic ophthalmia is an organism causing granulation lesions (bacillus), and not a pyogenic organism (coccus). The fact that the affection develops in from three to twelve weeks is in accord with this hypothesis. As for the route followed, we do not know what it is unless it is the optic nerve, the ciliary nerves, and the vessels. Perhaps sympathetic fibres will be discovered connecting the two eyeballs.

The case which serves as a basis for this theory is quite peculiar. A girl, six years of age, injured her left eye with a knife. Three weeks after, there was lachrymation in the right eye. The child was brought to Hirschberg's clinic six weeks after the accident. In the left eye was found a wound of the limbus with adhesion of the iris. The fundus of the eye was normal; the child counted five fingers at five metres. In the right eye, there were precipitates on the posterior surface of the cornea, pigmentary deposits on the anterior surface of the lens, a slight disturbance of the vitreous, and circumscribed white spots in the periphery of the retina—in fact, the signs of irido-choroiditis with slight reactionary symptoms. Five months after, the lesions were almost identical in both eyes. In October, 1894, the injured eye had better vision than the other.

It may be asked whether these were true sympathetic symptoms, and it is astonishing that Hirschberg has not at least discussed the hypothesis of a coincidence.

IV.—A Vaccine Affection of the Eye, Not Formerly Described,
by Dr. PURTSCHER.

A woman, thirty-three years old, had on one side œdema of the lids and swelling of the pre-auricular ganglia. There was found in the upper cul-de-sac an œdematous swelling of the conjunctiva. Over this swelling was seen a series of gray points looking like grains of sago. There was no real ulceration. Slight chemosis and no secretion. The disease was cured in a few weeks. Purtscher thinks that this was a vaccine ophthalmia, because thirteen days before the beginning of the ophthalmia this woman's child had been successfully vaccinated.

IV.—BOOK NOTICES

BOOKS AND THESES

A Simplified Cataract Operation, Method of Dr. A. Trousseau, by Dr. TENNAUT. (*Thesis of Paris*, 1894.)

After preparatory sterilization of the instruments with 90% alcohol, and of the operative region with boracic acid or $\frac{1}{2000}$ sublimate solution, and after cocainizing the eyeball, Dr. Trousseau, in cases of senile cataract, performs a superior section of the cornea, without lid retractor, with a von Græfe knife, which serves at the same time to tear or transfix the capsule of the lens. When the section is made the back of the knife is pressed against the lower portion of the cornea, thus aiding the escape of the lens. The operation requires about thirty seconds. At the end of six days the dressing is removed and the patient is able to leave the hospital. This method assures perfect asepsis, and gives great security against prolapses of the vitreous.

The author closes with the statistics, taken from the bulletins of the clinic of Quinze-Vingts, of the last four years in the practice of Dr. Trousseau.—DE BOURGON.

Treatment of Epithelioma of the Skin of the Lids and the Nose with Methyl Blue Combined with Chromic Acid and the Galvano-Cautery, by Dr. DOMEC. (*Thesis of Paris*, 1895.)

In all forms of superficial cutaneous epithelioma, methyl blue seems to have, on account of its marked antiseptic and penetrating properties, a selective action on morbid tissues, either because it acts directly on the specific parasitic element of cancer, or because it favorably modifies the abnormal development of the epithelial cells of the neoplasm. The galvano-cautery and chromic acid remove the necrosed tissue and the secretions from the field of operation, and thus favor the penetration of the methyl blue.

In the forms where the conjunctival mucous membrane, and more especially the lachrymal canals, are invaded, treatment is longer and more difficult, but methyl blue seems, nevertheless, to be of real value in such cases.—VALUDE.

MEDICAL JOURNALS

A Case of Hemorrhagic Glaucoma, by Dr. JOHN DUNN. (*Virg. Med. Month.*, January.)

M. P——, aged 60. Syphilis in early manhood. On February 24, 1894, patient retired to bed in good health. On arising the next morning he noticed that the sight of his left eye was practically gone. He could distinguish, however, light from darkness. No pain about the eye. No external inflammatory signs.

On March 6 he consulted Dr. Dunn. Tension of the globe normal. Examination showed the fundus of the eye to be the seat of innumerable hemorrhagic areas of greater or lesser size. They were most numerous and largest about the macula. The region of the optic disc was much swollen.

Vision of the right eye was practically normal, although the ophthalmoscope revealed numerous deposits, in some places resembling drops of rain, and in other places they were pearly in color.

Urine, heart, and lungs were normal.

The seat of these deposits was in the choroid, as was shown by the normal visual acuity.

Iodide of potash was given internally. Hot baths to the eye. Irritation to the skin of the temporal region. Under this treatment the swollen condition of the disc diminished considerably, and there was some absorption of the hemorrhages.

On March 25 the eyeball began to pain and to be slightly injected about the corneal margin.

On March 31 the tension of the ball began to get above the normal. Eserine was ordered to be put into the eye twice daily. This produced such pain that after the second instillation the patient refused to have it.

April 2 the eyeball was painful on pressure.

April 3 the cornea had begun to become cloudy, and two small hemorrhagic spots appeared on the surface of the iris. The pupil was not dilated.

April 4 pilocarpine was used twice daily with hot applications to the eyes. The tension had become normal, the hemorrhages on the iris had disappeared, and the eye was less painful.

April 5 the pupil was irregularly dilated and a small deposit of pigment or blood appeared on the iris. The tension was normal, although the eyeball was much injected and there was some tendency to œdema of the bulbar conjunctiva. Pupil responds less actively to light than in the other eye.

From this date till April 16 the symptoms of glaucoma increased and the pupillary deposit grew larger. The tension also was increased.

April 24 numerous small hemorrhagic spots appeared on the iris.

July 15 the redness had left the eye and the hemorrhages of the fundus had almost disappeared. Tension of the ball slightly +. There was no pain. Vision had slightly improved. No swelling about the nerve.

November 15 the patient had suffered no inconvenience in the left eye since July.

Vision had slightly improved.

Pupil attached below at margin to lens.

The tension of the eyeball was practically normal, and there were no more hemorrhages in the fundus of the eye.

The changes noticed in the choroid may have been, according to Dr. Dunn, amyloid in nature, and the hemorrhages may have detached particles of these diseased areas which, carried off by the lymph, might act as foreign bodies. This fact caused the attack of glaucoma, the ultimate cessation of the symptoms, and the relatively benign prognosis.

Vaccinal Blepharitis, by Dr. COHEN.

(*Wiener Klin. Wochenschrift*, 1894, No. 52.)

Since attention has been called to vaccinal blepharitis this disease has been observed everywhere. It is, however, probable that these cases do not yet always receive a proper diagnosis. For the nosography of the disease, I refer to the article by Dr. Schirmer (See *Annales d'Oculistique,* Vol. CVI., p. 189), who has given a very exact description of the characteristic ulceration.

The cases described by Dr. Cohen were observed at Prof. Fuchs' ophthalmological clinic (Vienna). The eruption almost always begins eleven or twelve days after the vaccination of the child from whom the patient acquires the contagion. In one case a stye, preceding the vaccinal blepharitis, was the point of entry.

Why should vaccine produce ulcerations on the lids instead of the typical vesicle? Dr. Cohen thinks that the great abundance of germs in the cul-de-sacs produces a secondary infection. It is, in fact, easy to find the presence of numerous staphylococci and diplococci in vaccinal ulcerations of the lids.—SULZER.

V.—MISCELLANY

CORRESPONDENCE

(Open letter to the *Annales d'Oculistique.*)

Ocular Accidents Caused by Cold.

In connection with the case reported by Dr. Duboys, of Lavigerie, to the Ophthalmological Society of Paris, and mentioned in the April number of this journal (see p. 247), it may be interesting to learn that serious ophthalmias from the action of cold are well known in the northern part of Norway. They appear at the time of snow-storms, which are frequently accompanied with very severe cold. The Finns, who form the greater part of the population, treat these cases with massage. If this is not performed a short time after the beginning of the ophthalmia, the disease frequently takes a fatal course. In 1888 I had occasion to examine a pastor who had had this disease six months before. Being a member of the Chamber of Deputies, he was obliged to make a journey to Christiana in January. While in the mountains, he was surprised by a snow-storm, and was obliged to pass the entire day outside with his travelling companions. The left eye—the wind coming from that side—commenced at midday to become very painful, red, and swollen. In the evening, when they reached a house, he could not stand the light of a lamp. His companions informed him that he would probably lose his eye ; but a Finn arrived a short time after, and being questioned concerning the treatment of this disease, replied that he could promise a cure, and the pastor's companions advised him to trust his eye to the Finn. The latter commenced treatment immediately. After washing the patient's face and his own hands, he rubbed the eye from the centre toward the periphery. Then he folded a handkerchief, covered the eye with it, and commenced to blow through the handkerchief on the eye. He then repeated the massage. The pain subsided quickly under this treatment, and the patient slept afterwards. On the next day the eye was still somewhat red, but vision was almost completely re-established, so that he was able to continue his journey. Except a slight myopia, I found nothing abnormal in the patient's eye. The vision of both eyes was normal.

OLE BULL (Christiana).

ITEMS

Dr. W. Czermak has been made Professor of Ophthalmology of the Faculty of Medicine of Prague.

An Ophthalmological Section of the Medical Association of Georgia was recently organized, with Dr. J. L. Hiers as *Chairman*, and Dr. W. F. Aiken as *Secretary*.

The *Buffalo Medical and Surgical Journal*, which has long been a familiar and welcome visitor to a large circle of readers, is presently to celebrate its semi-centennial anniversary. The *Journal* was one of the first to give to *Annales d'Oculistique* in its new form a hearty welcome, and we sincerely reciprocate its kindly sentiments. Its past history is abundant assurance that it will start on its second half-century with new vigor and interest.

NECROLOGY

Dr. Fano (Paris), former Associate Professor of the Faculty of Medicine.

Dr. Rydel, Professor of Ophthalmology of the Cracovie Faculty of Medicine.

Dr. Maklakoff, Professor of Ophthalmology of the Moscow Faculty of Medicine.

ANNALES D'OCULISTIQUE

Volume CXIII.—Number 6.
JUNE, 1895.

I.—ORIGINAL CONTRIBUTIONS

MEMOIRS

DOUBLE VERTICAL STRABISMUS AND SYMMETRICAL DEVIATIONS OF DEGREES LESS THAN STRABISMUS

By Dr. **GEORGE T. STEVENS.**

(Continued from the April number, page 232.)

We have already seen that, by virtue of the peculiar insertion of the vertically acting muscles, a condition of esophoria may be induced by excessive tension of these muscles. For example, if the eyes have an unfavorable tendency downward, and a strenuous effort on the part of the superior recti is demanded to overcome this tendency, the eyes may receive an impulse inward, independent of any want of balance on the part of the laterally acting muscles.

This is not only the case in theory—it is not very infrequently the fact in practice. It is in conditions of this kind, but in which there is usually an inequality of vertical tension, that we meet with a class of cases to which I have frequently alluded in former papers. In these cases there exists an esophoria, perhaps of a considerable degree, as shown by the phorometer, yet there exists also an ability to overcome prisms in abduction even greater, and in some instances much greater, than can be overcome in the condition of orthophoria. In other words, with an apparent tendency of the visual lines to deviate inward, there is an ability to separate them even more than in the case in which no such tendency exists.

Such cases have presented great difficulties to me, for it has been evident that complicating forces were acting to induce the anomaly. A correction of the esophoria under such circumstances, by means of prisms or by operative means, would evidently be contra-indicated, while a correction of the excessive abduction by either of these measures would be equally unsuccessful.

In such conditions, I have in former papers advised the persistent search for hyperphoria; yet, despite corrections for manifest hyperphoria, in a certain number of cases the inconsistent tests remain.

If we take into consideration the fact that such an abducting ability may, and often does, mean that in a passive state the dynamic condition, so far as the lateral muscles are concerned, would be represented by exophoria, and yet that esophoria actually exists, which is induced wholly by the vertically acting muscles, we have an explanation which permits us to expect that by the correction of the inordinate vertical tension consistent tests may result in respect to the laterally acting muscles. And this it is that happens in practice.

But another form of irregular anomaly is even more frequently met with. It is that form in which, with a moderate or quite important grade of exophoria, there is yet restricted abducting ability. For example, a patient may show by the phorometer exophoria 1°, 2°, 3°, or more, and yet not be able to overcome a prism with its base in of more than 2° or 3°, and it may even occur that with exophoria 1° to 2° there is homonymous diplopia. Here, too, I have advised the continued and patient search for hyperphoria, and in many instances the search for this condition and its correction are rewarded by a correction of the inconsistency, either full or partial. There exists, however, a proportion of these cases in which I have been unable to bring about more than an approximate uniformity in the tests by simple hyperphoria corrections.

Here, again, the excessive tension on the vertically acting muscles of each eye is the cause of the trouble, but it is not a symmetrical excess. There is, in this group of cases, anotropia or katotropia, combined with hyperphoria. When the difficulty of adjusting the eyes for the proper plane, therefore, is great, as it often is, only limited relief is to be expected from the correction of hyperphoria alone.

In some instances of this class I have found it necessary to reduce the upward rotation of both eyes to the extent of 10° or 12° (prism) before consistent lateral tests could be obtained. It is surprising to hear the expressions of relief from some of the patients from whom this great burden of adjustment has been removed.

I have shown (*Annales d'Oculistique*, October, 1892) how the action of the eye muscles affect the expression of the face, and to what an extent a change in the efforts demanded for the adjustment of the eyes may modify the habitual expression; but I have also shown that in certain conditions of the lateral or vertical eye muscles there may be different expressions, depending upon whether the conditions are simple or complex.

I have alluded to these expressions here in order to introduce another characteristic peculiarity, one depending upon these double tendencies of the eyes to deviate up or down. This peculiarity consists in an habitual thrusting forward of the upper or the lower part of the face.

Here again we shall find that the general rules are modified by special conditions. A considerable element of hyperphoria may materially alter the carriage of the head in a given case with anophoria or katophoria, but the rule is very general that with a tendency of the eyes downward (katophoria), there is an habitual protrusion of the chin. A person with downward balance of the eyes prefers to lift the chin to drawing upon the eye muscles; on the other hand, the forehead is habitually advanced in many cases where the eyes are balanced upward. That a proportion of these cases of each variety habitually carry the head in the normal position is true, but it is rare, in extreme cases, unless one eye is permitted to deviate.

This peculiarity of carriage is conspicuously shown in many myopic persons, a fact which, while it is not the purpose of this paper to discuss the etiology of myopia, leads to the remark that in my investigations I have found so great a proportion of myopic cases associated with hyperphoria or with restricted rotation, either in the upward or downward direction, that it appears to me to be quite reasonable to attribute the lengthening of the eye to the extreme tension of the muscles acting in the vertical direction, combined with a condition of the eye itself to be presently mentioned.

In this suggestion I do not forget that von Græfe believed that the tension of the lateral muscles, in the condition which he called "insufficiency of the interni," was to be regarded as an element in the causation of myopia. This view, however, had much less to sustain it, since so large a number of myopes have esophoria, while a large proportion have no extreme degree of either esophoria or of exophoria.

If we accept the view that anomalous action of the ocular muscles may induce nervous reaction, a view which I believe has been so abundantly demonstrated that it is beyond a doubt by those who have become .informed on this subject, we may see that a hyperæmic condition of the walls of the eye being induced as a reaction from the condition of hyperphoria, a pressure upon these hyperæmic, and therefore less resisting, walls might easily mold the eye into the myopic form. We may thus have in the etiology of myopia two elements: first, a weakening of the walls of the eye, and second, an inordinate pressure upon them, extending them in the antero-posterior diameter. It is also a fact worthy of notice that the immense sursumduction (often 9° or more, right and left) which is often found in myopia disappears after correction of katotropia in these cases.

I have tabulated many hundreds of cases of myopia, and find that a condition of deviating tendency in the vertical direction of one or both eyes is so general that it may well be regarded as universal.

That such tensions should also induce irregular curvatures of the cornea, and that such irregularities should at the same time occur so uniformly in certain meridia as to gain for them the appellation of irregularities according to the rule, is also reasonable to suppose.

But the fact of practical and of great importance is that even after the cornea has been thus irregularly developed a proper relaxation of the tension of the vertically acting muscles not infrequently modifies the astigmatism by reducing it, and in some cases of moderate astigmatism the cornea after a short time returns to the regular curvature.

This statement is neither speculative nor exaggerated. It is the summing up of actual experience, and the facts are demonstrated both by the effects of glasses and by examinations made by the ophthalmometer. That nervous disturbances of a general character should arise from these anomalous conditions will be readily understood by those whose experience has led them to recognize the multiform disturbances arising from heterophoria.

Those who have systematically studied the effect of correction of heterophoria have had occasion to meet with instances in which treatment directed to heterophoria has been successful, but only up to a certain point; sufficiently successful to satisfy both patient and physician that the trouble was ocular, yet stopping short of entire relief.

That the conditions under discussion have an important bearing upon a considerable proportion of these cases has been demonstrated in my own experience, for in cases in which the correction of heterophoria has been, so far as repeated tests made at considerable intervals would show, complete, I have been able, on attending to the conditions here discussed, to see the nervous reactions, only in part dissipated by former treatment, disappear entirely.

In order to illustrate the conditions in which there is actual deviation of the eyes, either directly up or down, or in the vertical and lateral plane, and more especially to show the extent to which the action of the vertical muscles may influence lateral deviations, I shall introduce a few cases in which the deviations are evident.

The first case is one of direct upward deviation of both eyes.

Miss E. M——, aged fourteen, was sent to me by Dr. W. V. White in July, 1894. The girl had been subject to constant headache as long as she could remember, often accompanied with dizziness. The persistent and intense pain in the head at length compelled her to abandon school, yet even when she was not engaged in study there was great distress.

She was found to be a robust girl, with no organ diseased, and with no apparent cause of disturbance except the eyes. Examination of these organs shows: vision of right eye, $\frac{6}{18}$; of left eye, $\frac{6}{8}$, each with + 1.50 spherical.

Excluding either eye, the other deviates directly up 4 to 6 mm., but it is the right eye which generally deviates, or, as her friends state it, "rolls up into her head," while the left eye is usually chosen for fixation. She can, however, fix either eye at will; then its fellow deviates up. When she is fatigued the deviating eye rolls further up than when she is fresh. There is no indication of paresis; indeed, there is ability to rotate the eyes freely in all directions, except that the upward rotation is much greater than the downward.

If a red glass is placed before the right eye and she fixes the left, there is vertical diplopia, right hypertropia 5° to 12°. If the red glass is changed to the left eye and she fixes the right eye, there is left hypertropia, 3° to 8°. In both instances it is easy to see that only a portion of the vertical distance between the images is measured, for the patient can be seen to balance the eyes up and down, and it is evident that to a large extent the location of the images is modified by these movements.

The deviations upward are, in fact, more than would require a prism of 20° for correction, for, even when such a prism is placed with its base down before the deviating eye, and the other eye is excluded, the deviating eye is seen to move down for fixation. It is, therefore, impossible, from the statements of the patient, to form a correct judgment of the actual amount of deviation of the images.

In moving from deviation to fixation each eye moves down almost exactly in a vertical line, and in returning from fixation to deviation each moves directly up.

The figures 1 and 2 show the position of the eyes: 1, when the left eye is fixed; and 2, when the right is directed to the object.

After examinations, made on four or five successive days, graduated tenotomy was done on the superior rectus of the right eye, and a week later a similar operation was done on the left eye. These relaxations were found to be insufficient to prevent the upward deviations of the eyes, and other careful tenotomies have been done on each of these superior recti since then.

The result has been to correct the deviations to the extent that it can only be perceived when the observer passes a card from one to the other eye and watches carefully for the movement. Each eye, under these circumstances, may be seen to move up very slightly in exclusion, but it has been thought best to permit considerable time to elapse before resorting to attempts at a more perfect correction.

From the first relaxations the pains in the head have become less intense and very much less constant, and the girl has been able to resume her place in school; she is no longer dizzy. It is not to be expected that a complete freedom from headache will be experienced until more exact corrections of the ocular defects are made.

The two following cases illustrate the effects of a strong tendency of the eyes to deviate upward, but to an extent which is unequal, and in which a converging squint results.

Miss R——, aged eleven, was brought to me in April, 1893, her parents expecting me to operate for "cross eyes."

Vision—right, $\frac{20}{20}$ with 4.50 sph.
left, $\frac{20}{100}$ " " "

The left eye turned in in a marked but not extreme manner. It is extremely difficult for her to locate the image with the left eye, but apparently a prism of 20° base down before the left eye brings the images to the same plane when the right is directed, and a prism of from 10° to 15° accomplishes the same when the left is directed. These results were obtained after very patient examination, renewed on different days during the week. With a prism of 20° with its base down before the left eye, images sometimes unite and at times are also crossed.

Careful study of the case convinced me that the converging squint did not arise directly from the relations of the lateral muscles, and that in fact the probable position of the eyes, so far as these muscles were concerned, was one of divergence. This conclusion was communicated to her parents with the statement that to correct the squint in the ordinary manner, which could be done in a few minutes, would be a misfortune, but that a rational correction might require much time and involve considerable trouble.

The latter course was taken. Careful relaxations of the superior recti have been made, allowing some months to elapse between the operations; there remains a slight deviation of each eye up behind the screen, with the left still rising more than the right. There is an absence of squint except for a moment occasionally, a deviation evidently due to the remaining inequality of the relative tensions of the superior recti. For the most part the eyes appear to diverge, and, indeed, by the phorometer she shows exophoria 6°.

The cut, Fig. 3, indicates the strabismic condition of the left eye at the time of her first examinations, and Fig. 4 shows the absence of any converging squint since the treatment was directed, not to the laterally acting, but to the vertically acting, muscles.

It is not my wish, in introducing such cuts, to intimate that photographs can indicate when a perfect or proper correction for strabismus has been made. These are intended to serve the purpose only of showing that, whereas there existed a marked converging squint, there is now no such deviation, although the interni and externi have remained undisturbed. Neither these nor the two following cuts (Fig. 5 and Fig. 6) have any other

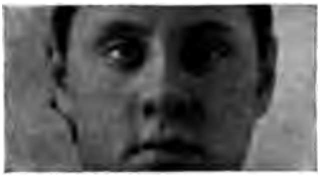

Fig. 1.

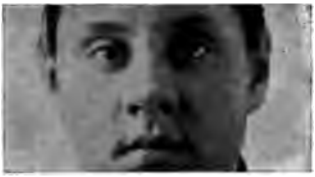

Fig. 2.

Fig. 1.—**Left eye in fixation, right deviating up.**

Fig. 2.—**Right eye in fixation, left deviating up.**

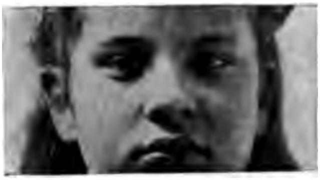

Fig. 3.

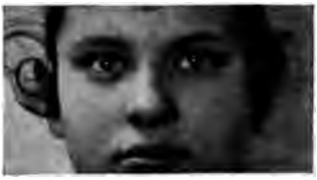

Fig. 4.

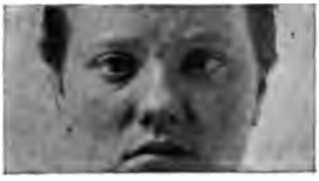

Fig. 5.

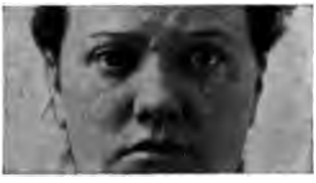

Fig. 6.

Figs. 3 and 5.—**Cases of converging strabismus depending on vertical deviations.**

Figs. 4 and 6.—**These cases after treatment directed to the superior recti only.**

purpose. They could not be introduced as perfect corrections of strabismus, even if such pictures could ever show such corrections. In both these cases there is much careful work to be done before a complete equilibrium will be attained.

I introduce another illustration of the result of treatment directed to the superior recti in a case of converging strabismus.

Miss L——, twenty-five years of age, was first seen by me in March, 1893.

She had for years been subject to headaches of a most tormenting character.

Vision, each eye, $\frac{6}{6}$ with cyl. + .50 at 90°.

Ophthalmometer shows astigmatism $\frac{1}{2}$ D. with the rule. There was marked but not extreme converging squint, the left eye deviating.

After much practice the patient was taught to recognize the double images when a red glass was placed before one eye. After this recognition it was found that if she directed the right eye, she had left hyperphoria of about 5°; or if directing the left eye, she had right hyperphoria of about the same extent. As in the former case, these measurements were far short of the actual difference in the directions of the eyes, but were largely modified by the movements which the patient made to bring first one then the other eye to fix the object. Each eye deviated up when in exclusion from 10° to 15°. The photograph, Fig. 5, was taken before any corrections were made.

Very carefully graduated tenotomy was done for each superior rectus, and after a few weeks the operation was repeated on each eye, but, as appeared later, without a full correction of the tendency to diverge up.

The cut, Fig. 6, indicates the absence of converging squint following these operations. When a card is passed from one eye to the other while the patient fixes a distant object, each eye is seen not only to deviate very slightly in the vertical direction, but outward. Thus the converging squint is not only relieved, and the relief has been permanent, but an exophoria is shown, notwithstanding the lateral muscles remain undisturbed.

But it is not only the cases of moderate convergent strabismus which may be corrected by attention to the vertically acting muscles. Cases of extreme deviation yield to similar treatment, and it is probable that a great proportion of cases of convergent strabismus of all grades are the result, to a greater or lesser extent, largely or mainly, of the conditions which I have called anotropia and katotropia.

It remains to return to the consideration of these lesser deviations which are not indicated by any visible deviations.

MYOPIA, CENTRAL CATARACTS, AND CENTRAL LEUCOMAS

By Dr. **ROURE** (Valencia),
Licentiate of Physical Science.

For a long time it has been known that myopia will appear in persons with commencing central cataracts.

In the first half of this century Scarpa called attention to this fact, and explained it by an increase in the size of the lens resulting from the softening which it undergoes.

Drouot also noticed that patients with commencing lenticular cataract brought objects which they examined near to their eyes and became myopic. He found, also, that the use of a mydriatic increased their vision.

Arlt thought that if the capacity of vision was reduced it was dependent upon the interception of the luminous rays by the opaque portions of the lens, thus causing amblyopia.

At the Tübingen clinic, Schleich (1) found in 578 myopes 12 anterior or posterior polar cataracts, 22 zonular cataracts, and 75 progressive cataracts. He also noticed the coexistence of myopia and opacities of the cornea, a fact to which I will shortly recur.

Landesberg (2) describes 5 cases of senile cataract in the development of which a myopia appeared which was corrected by concave glasses.

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(1) Clinical and Statistical Contribution to the Study of Myopia. (*Recueil d'oph.*, 1882, p. 694.)

(2) LANDESBERG: On the Development of Myopia During the Formation of Senile Cataract. (*Centralblatt f. Augenh.*, 1884.)

Dor, in reviewing this article, remarked that he had frequently observed the same fact in commencing cataracts. He adds that in this case the myopia is only apparent, and after extraction does not diminish the ordinary hypermetropia.

Galezowski (1) also found the same conditions in two cases of central cataract, one of posterior polar cataract, and two of zonular cataract. He thinks that this myopia is real, and that t is due to an increase in the thickness of the lens.

Panas likewise mentions the appearance of myopia, and makes t dependent on an increase in the index of refraction or an increase in the curvature. In zonular cataracts he asks whether the myopia is progressive or is due to an excessive tension of the ciliary muscle and the muscles of convergence.

It will be seen that, until the present time, this question seems to have been neglected by the principal writers, who only incidentally give their opinion on the subject.

Quite recently, in an article published in the *Annales d'Oculistique* (Feb., 1895), Dr. Demicheri explains, under the title of false lenticonus, the phenomenon under discussion by a difference which occurs, in the beginning of cortical cataract, between the refraction of the nucleus and that of the cortex of the lens.

But how, then, is the myopia explained which is ordinarily associated with zonular and polar cataracts? These cataracts are congenital and generally stationary. Consequently, the portions of the lens affected by the process are already completely opacified when we are called to examine them, and the examiner cannot witness the development which modifies the refraction of the lens. How, also, is the appearance of myopia, which so frequently accompanies central leucomas of the cornea, o be explained ?

It seems to me that a very simple explanation can be given of these phenomena.

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(1) GALEZOWSKI. (*Recueil d'oph.*, 1880, p. 692, and 1882, p. 665.)

I shall consider principally here polar and zonular cataracts, but what follows is equally applicable to every opacity, either of the lens or of the cornea, occupying the centre of the luminous bundle which penetrates the eye.

The explanation which seems to me to be applicable to all these phenomena rests entirely on the following statement:

There is dilatation of the pupil in the majority of persons with central cataracts or central leucomas of the cornea.

This dilatation is very marked in young persons, on account of the greater elasticity of the iris tissue. It is less extensive in aged persons. It is ordinarily quite considerable in persons with zonular cataract.

Vision is effected, in these persons, by the transparent annular portion situated between the opacity and the border of the pupil, but at the expense of myopia, the appearance of which I shall explain.

When the iris occupies its normal position in a normal eye longitudinal aberration may be neglected, since only the central rays penetrate the eye.

If the pupil is dilated, not only the central rays penetrate the eye, but also rays which are, if not marginal, at least less central. The result of this is longitudinal aberration more or less considerable, causing in part the visual disturbance which ordinarily accompanies atropinization.

If, under such conditions, an opaque screen be placed in the centre of the bundle of rays which traverse the media of the eye, this screen will intercept the central rays. Consequently, the focus of the central rays will disappear, and only the focus of the marginal rays will remain.

But, in a converging system, the focus of the marginal rays is further from the posterior nodal point than the focus of the central rays. If, then, the latter is on the retina, the former will be in front of it.

A central cataract plays exactly the same part as the screen, which intercepts the central rays. The posterior focus of the eye will then be displaced in front of the retina. The eye thus constituted will act like a myopic eye—that is to say, it will be necessary to use a diverging lens to bring the posterior focus on the retina.

The myopia is, then, only apparent, and, as Dr. Dor states, if the lens is extracted it has no influence on the later hypermetropia.

A simple calculation, however, allows us to account for the degree of myopia which may be produced under the preceding conditions.

As the calculation for aberrations in thick lenses is long and difficult, and as I only desire here to obtain an approximation, it will be sufficient to consider what occurs in a uniform refractive medium limited by a spherical surface.

It is known, in fact, that the ocular dioptric system may be reduced to such a system.

But the principal longitudinal aberration of such a system is given, in absolute value, by the formula

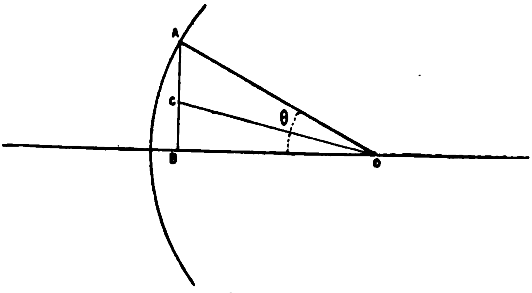
$$\lambda = \frac{R\ Sin^2\Theta}{2n\,(n-1)}$$

an expression which may be written

$$\lambda = \frac{R^2 Sin^2\,\Theta}{2Rn\,(n-1)}$$

R is the radius of curvature of the spherical surface, and Θ the semi-opening of the portion of this surface utilized. But

$R\ Sin\ \Theta = AB$



AB is the radius of the cylindrical bundle of rays as it penetrates the system; in the eye, it is the radius of the pupil.

The expression for longitudinal aberration then becomes

$$\lambda = \frac{\overline{AB}^2}{2Rn(n-1)}$$

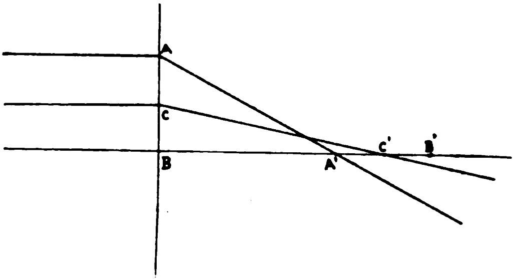
Suppose now that a screen with a radius BC, having its centre in the axis of the system, intercepts a portion of the rays.

The longitudinal aberration will diminish by

$$\lambda = \frac{\overline{BC}^2}{2Rn(n-1)}$$

Its value will be $\lambda - \lambda_1$.

In fact, in the optical system under consideration the marginal rays falling on A will come to a focus in A′, the central rays falling in the neighborhood of B will come to a focus in B′, and the intermediate rays, such as C, will come to a focus in C′, situated between A′ and B′.



As a result of the interposition of the screen BC, the longitudinal aberration is reduced to A′C′. But the point in A′C′ where the transverse aberration is the least considerable is A′. Therefore, the eye, to have clear vision, is forced to bring this point on the retina.

The distance of this point A′ from the retina—that is, the distance A′B′—measures the degree of myopia created by the dilatation of the pupil and the interposition of the screen.

It is interesting to notice here that if, in normal vision, the aberration is very slight, it is not so in the actual case. For the preceding formulas show that the aberration is proportional to the *square* of the radius of the pupil, and that to an annular pupillary opening, such as AC, will correspond an aberration *relatively* far more considerable than that which is due to an opening situated in BC, even if BC = AC.

This being granted, Listing teaches us that for approximate calculations we may consider the eye as a uniform spherical refracting surface, separating the air from a media with index of refraction 1.43, the radius of curvature of this surface being 5.51 millim.

The formulæ which we have taken to express the aberration are applicable to this case.

If we substitute their values for the letters the desired aberration becomes

$$\lambda = \frac{\overline{AB}}{2 \times 5.51 \times 1.43 \times 0.43} = \frac{\overline{AB}}{6.77}$$

Suppose the pupil to be dilated and its radius equal to 3 millimetres. The aberration is then

$$\lambda = \frac{9}{6.77} = 1.3^{\text{mm.}}$$

that is, the posterior focus of the eye is 1.3 millim. in front of the retina.

It would be easy to show that in this case the eye is myopic to the extent of 3.1 dioptres.

A central opacity leaving between it and the border of the pupil an annular opening, then, explains the appearance of myopia, as is shown by the above cases.

In support of this thesis I will add the following statements, which have occurred to me during the preparation of this article:

1st. Persons with central leucoma of the cornea are, *in general*, myopic. In five patients with central leucomas, recently examined, vision *in all* was improved by concave glasses.

2d. In a young girl with a large central spot on the cornea, occupying the whole pupillary field, and having scarcely $\frac{1}{100}$ vision, dilatation of the pupil with scopolamine and the interposition of a 2-dioptre concave glass brought the vision up to $\frac{3}{20}$.

3d. A man, sixty-one years old, with normal vision in the left eye, and who is a good shot, and always uses the right eye for aiming, has now a central ulcer on this eye with vision of $\frac{1}{20}$. After dilatation of the pupil and the interposition of a 2-dioptre concave glass, vision increased to $\frac{3}{15}$.

4th. Finally, I have made the following experiment: In the right eye of a patient with hypermetropia of 1 dioptre, after immobilizing the lids with a blepharostat and dilating the pupil, I made a spot in the centre of the cornea with vaseline. It is quite easy thus to obtain an artificial leucoma perfectly comparable to pathological leucomas.

Vision, at first normal, decreased to $\frac{3}{15}$, and then, by the interposition of a 3-dioptre concave glass, it increased to $\frac{3}{5}$.

These observations and experiments need to be repeated. However, they agree one with another, and with the theory, and go to show that the myopia observed in persons with central cataract or central leucoma is due to the interposition in the path of the luminous rays of the lens, or corneal opacity.

THE RELATION OF THE AMPLITUDE OF ACCOMMODATION TO STATIC REFRACTION

By Dr. **FROMAGET**,
Chief of Clinic of the Medical Faculty of Bordeaux.

Last year my preceptor, Prof. Badal, had occasion to examine the static refraction and the visual acuity of a large number of students, and requested my excellent friend Dr. Bordier and myself to assist him in this work.

I took advantage of this rare opportunity to make some investigations on the subject of the amplitude of accommodation, the results of which I will here record.

I am far from being persuaded, as is every one else, that these relations were established in a definite manner by Donders and his pupils.

We are accustomed to hearing it said and repeated that the *amplitude of accommodation is independent of the condition of static refraction*—that is, that at a given age every myopic, emmetropic, or hypermetropic person has an identical amplitude.

On what ground does this affirmation rest? I have sought for the data establishing such a demonstration in Donders' work, and must admit that I have found nothing which permits one to refer to Donders a demonstration which he never made.

If Donders measured the amplitude of accommodation in ametropia, he does not mention it. All the eyes which served him in establishing his curve were emmetropic, slightly hypermetropic, or myopic less than one dioptre.

I will quote his exact words in this connection:

"The course of *p* in the emmetropic eye was deduced from a great number of observations. In Fig. 105 each observation is indicated by a point, and the position of these points shows, at the same time, that the deviations of the mean course are not particularly great. And still these must undoubtedly be in part ascribed to error in observation; in some, a slight degree of hypermetropia may also increase the deviations. In the preparation of this table, emmetropic eyes were, for the most part, used; but also eyes affected with a slight degree of M ($=1 : 40$ or less) were not excluded. These last even deserve to be preferred. Indeed, in these alone we have, without artificial paralysis of accommodation, sufficient security that the nearest point is not influenced by a latent H, and we may safely assume that, with these degrees of M, $\frac{1}{A}$ is equal to that of the emmetropic eye."

It is thus seen what were Donders' materials even for the neighboring cases of emmetropia. It is also seen that latent hypermetropia was the cause of several insignificant errors in his observations. But he does not speak of ametropia.

In disregarding the slight errors which Donders mentions in the determination of the remote point I should also speak briefly of the method employed by the celebrated Utrecht ophthalmologist in determining the near point.

Certain treatises designate under the name of Donders' method for the determination of the near point the method called "by trial glasses."

It will be sufficient to consider Donders' work on the amplitude of accommodation in relation to convergence to be convinced that he did not have recourse to a method so inexact and defective. If it is desired to give his name to a method for the determination of the near point, and that would seem to me quite just, it would be proper to call *the clinical method* the *method of Donders.* That is, in fact, the method which Donders employed.

But here is how he describes it himself:

"The determination of the nearest point is effected by means of a wire optometer. This consists of a little frame in which some fine black wires are vertically extended, and wherewith a measure, capable of being rolled up, is connected, the scale commencing at the frame, and the bobbin being applied to the temple, on a line with the anterior surface of the cornea. This bobbin is, by moving the frame out from the eye, unwound until the vertical wires are seen with perfect accuracy. It is, indeed, possible to determine by means of such wires with sufficient accuracy whether they are exactly seen, as by a slight deviation the margins lose their sharp outlines and more of these lines appear. The persons examined, for the most part, state this very easily. The reading of print capable of being distinguished at given distances in due accommodation, and by a sharp eye, may be used to control the result."

Whatever be the skill of the observer and the intelligence of the subject, this method is likely to cause some errors, which, especially in the near point, produce differences of one dioptre, and even more if, for example, 8 centimetres should be counted instead of 9. This method, which is very good because it enables the subject to exert all his accomodative power, is not mathematical.

I considered whether it would not be profitable to first control the researches of Donders by a different and more exact method, and then study the accommodation in the ametropes that I had at my disposal.

I determined the static refraction by ophthalmoscopy, keratoscopy, and, in certain rare cases of myopia, by Donders' method.

In determining the near point I used an instrument which is admirably adapted to this purpose—Prof. Badal's optometer.

Donders calculated the near point from the anterior surface of the cornea. I have measured it from the optical centre of the eye.

This is very easily done with the optometer by removing the eye-piece and bringing the subject's eye close to the tube. In this way the focus of the lens of the optometer is made to coincide with the optical centre of the eye. These considerations have been sufficiently discussed by my friend H. Bordier in a recent article in the *Archives of Ophthalmology* (September, 1894), so that I need not return to them now.

The diminution in visual acuity, which occurs as soon as the near point is passed, is far easier to control than the moment of appearance of the double contour of the wires in the clinical method. Finally, and more particularly, the graduation of the instrument allows one to measure a change of 0.25 D.—that is to say, absolutely exact results are obtained.

Under these conditions I have undertaken these investigations, and they should evidently give, even in emmetropia, results somewhat different from those of Donders.

I have determined the remote points, and my friend Bordier the near points, and the results have been verified by both of us. This double control is, in my opinion, of sufficient importance not to be passed over in silence.

We have measured the amplitude of accommodation in 408 students.

These 408 students may be thus divided:

Hypermetropes	156
Emmetropes	179
Myopes	73

We eliminated all cases of astigmatism, and all those with bad visual acuity. The age varied from seven to twenty-one years. Up to ten years only hypermetropes were found. These results confirm what I found last year in examining several hundred common school children: it seems to me to show that at this age hypermetropia is the normal condition of the eye which later may be myopic or emmetropic. All this portion of the curve is, then, new, since Donders only commenced at ten years.

The amplitude of accommodation at seven years is 14.40 D.; it decreases very slowly to ten years, when it is only 13.80 D. At ten years the curve of emmetropia commences.

The 73 myopes were all from thirteen to twenty-one years of age.

Before thirteen years very few were found, but beyond that age their number increased as they advanced in the higher classes.

In considering the curves which were traced in taking the averages of all these amplitudes it is easy to see that the three different conditions of the eye have three very distinct curves. The curve of hypermetropia is slightly convex upward from seven to ten years, but soon becomes concave upward, to reach, at twenty-one and a half years, 10.3 D.

The curve of emmetropia is inferior. At ten years it is identical with that of hypermetropia, but as the condition of refraction is more clearly confirmed, and as the student works more, the distance which separates them increases, and at twenty-one and a half years the amplitude of emmetropia is only about 9.5 D., 1 D. less than in hypermetropia.

In myopia the difference is still greater; the curve is about 2 D. less than that of hypermetropia, and 1.20 less than that of emmetropia.

It will be seen that after fourteen years of age the three curves have parallel courses, and decrease in the same proportions.

The hypermetropia in these students varied from 1 to 2.5 D. The myopia extended from 1 to 4 D. We disregarded all the higher degrees of myopia, and all really pathological eyes. In examining these weak degrees of ametropia it is well seen, however, what considerable differences exist between them.

Here are the exact figures which resulted from the averages, and which were used in the construction of the curves.

	Amplitude of Accommodation in D.		
AGES.	H.	E.	M.
From 7 to 8 years	14.33	——	——
From 8 to 9 "	14.12	——	——
From 9 to 10 "	14.00	——	——
From 10 to 11 "	13.50	13.50	——
From 11 to 12 "	13.50	13.45	——
From 12 to 13 "	12.95	12.65	——
From 13 to 14 "	12.41	12.21	——
From 14 to 15 "	12.48	11.61	10.33
From 15 to 16 "	11.67	11.25	10.09
From 16 to 17 "	11.18	10.41	9.75
From 17 to 18 "	11.11	10.35	9.01
From 18 to 19 "	10.80	9.83	8.92
From 19 to 20 "	10.40	9.67	8.40
From 20 to 21 "	10.36	9.62	8.37

Thus we see that in the 408 students examined the amplitude of accommodation varied in a constant manner, according to the condition of the static refraction.

This amplitude was the greater in hypermetropia, a mean in emmetropia, and less in myopia. Convinced that as these results were obtained from so many observations they were absolutely correct, the investigations were continued with the assistance of Dr. Seguin.

The subjects examined were in general from twenty to thirty years of age, and that the conditions might be similar to those of the first investigations, students were examined almost exclusively. The remote point in all was determined by keratoscopy and the erect image.

The near point was obtained with Badal's optometer under the conditions indicated above.

These observations reached the number of 250 for a period of ten years. They proved that the law established did not vary.

In these cases, as in those under twenty, the amplitude in hypermetropia was greater than in emmetropia, and the latter, in turn, greater than that of myopia. The hypermetropia was

1, 1.50, and 2 D., and the myopia did not exceed 4 D. Only eyes exempt from all lesions were examined, that the value of the results might be maintained.

Thus, then, on the strength of 800 observations, covering a period of about twenty-one years, it was established in an indisputable way that the dynamic refraction varies with the static refraction!

But it remained to be proved that this variation was the result of the static refraction. If the remote point is made to vary by the use of correcting glasses, does the near point vary, and in accordance with the conditions stated above?

It is not necessary, in solving this problem, to make emmetropes wear concave or convex glasses: we have only to examine the amplitude in corrected ametropia.

By this means, as the correcting glass carries the remote point to infinity, the ametrope is thus placed in the conditions of an emmetrope.

The accommodation in a myope of 3 D., for example, is almost always at rest, since he does not see clearly beyond 33.1 centimetres for working, and objects are constantly placed at the remote point, thus dispensing with all accommodative effort.

But his myopia is corrected by a — 3 D. glass, and now, when he wishes to see at this same distance, he will be obliged to make an effort which increases his static refraction by 3 D.

He will be placed in the same conditions as an emmetrope, accommodating from infinity to a distance of 33 centimetres.

In hypermetropia the opposite is the case: the accommodative work is diminished.

What becomes of the amplitude in corrected ametropia ?

It *becomes equal to that of emmetropia.* This is very clearly shown in the numerous cases which we have examined.

In making a comparative table, as Dr. Seguin has done in his thesis, it is found that all the myopic subjects who do not wear correcting glasses have an amplitude less than that of emmetropia.

Those, on the other hand, whose ametropia is corrected, have an amplitude equal to that of emmetropia.

There are even myopic subjects who have the amplitude of hypermetropia, but this is easily explained by examining the glasses which they wear. They have glasses stronger than their degree of myopia, and hence are made hypermetropic, and their accommodation is obliged to comply with the latter condition.

Cases of anisometropia sometimes allow the truth of this law to be verified.

N. T——, out-patient at the hospital, had a myopia of 3.50 D. in the right eye and 1.75 in the left, and wore glasses of —2.50 D.

He was, then, after this correction, myopic to the extent of 1 D. in the right eye and 0.75 D. hypermetropic in the left. But his amplitude of accommodation was 7.50 D. in the right and 9.25 D. in the left eye. The difference found by me at several examinations was too great to be attributed to an error.

The amplitude in all the older myopic students was much greater than that in the younger ones, from the fact that the younger ones did not wear correcting glasses or did not wear them for working (under 4 D.). Their eyes were, then, really myopic, and functionated under the conditions relative to this ametropia.

The elder students, on the other hand, almost always wore correcting glasses, and their accommodation increased rapidly in considerable proportions.

It will thus be seen that a person twenty-one years old with corrected myopia has an amplitude superior to that of a person nineteen years old with uncorrected myopia.

Thus, in spite of the advance of age and the ever-progressive sclerosis of the lens, not only is the amplitude of accommodation in myopia maintained, but it may even increase.

In hypermetropia it is the opposite. With the use of correcting glasses the amplitude diminishes.

What, then, is the cause of this variation in the amplitude? What is the organ which, as a greater or smaller effort is required of it, produces more or less work, and which enables the eye to strive, not only against the advance of age, but against the variations of static refraction?

The lens is evidently not to be considered. It is passive in accommodation. The active organ is the ciliary muscle.

This muscle cannot, in fact, escape the general physiological laws. The greater the effort required of it, the harder it works, and, as its work is increased, it finally becomes hypertrophied and easily accomplishes an effort which at first was difficult.

The more powerful the contractions, the greater is the excess of refraction which it produces for the eye. The less it works, the less is the accommodation and the more it atrophies.

Clinical phyisiology is thus in accord here with anatomical researches.

Hypermetropes with a large and powerful ciliary muscle have the maximum amplitude. Emmetropes whose ciliary muscles are of normal dimension have a smaller amplitude. Finally, myopes whose ciliary muscles are pale and inactive have a minimum amplitude.

But if the contractions of the ciliary muscle increase or diminish, it is hypertrophied or atrophied, and the amplitude increases or diminishes.

ON THE USE OF LARGE SUB-CONJUNCTIVAL INJECTIONS

By Dr. **L. de WECKER.**

There can be no doubt now that a period of reaction has come as successor to the phase of enthusiasm aroused by the announcement of the effects obtained by sub-conjunctival injections. Such, indeed, is the fate of every new therapeutic effort which is supposed to have a general application.

Thus, a long analytical and clinical article by Dr. Gutmann (1) terminates with the following conclusion:

" Unfortunately, it would seem that the same lot awaits this new treatment with sublimate which has followed other therapeutic efforts the results of which have been published too soon, before conclusive experiments have been made. Great hopes have been awakened, much pain has been occasioned, scarcely a result has been obtained, and not a small number of cases have been harmed."

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(1) Ueber Sub-conjunctivaler Injectionen. (*Archiv f. Augenheilkunde*, Vol. XXIX., p. 286.

Although this pessimistic author classes me among those in favor of this new method of treatment, I would recall that, at the time of the discussion which took place two years ago, and also in the investigations made by the *Annales d'Oculistique* (Aug., 1893, p. 145), I have been, with my colleague, Masselon, hardly an enthusiast for sub-conjunctival injections of sublimate.

To claim an *antiseptic* action as the result of the injection of a drop of a $\frac{1}{1000}$ or $\frac{1}{2000}$ solution of sublimate, only a very small fraction of which reaches the eye and its cavity, is, in my opinion, to declare one's self a partisan of homœopathy. It is stated, in opposition to this, that experiments on animals show that after such injections it is possible to find the presence of mercury in the cornea, and even in the aqueous humor, but it seems to me that this proves nothing from the standpoint of its antiseptic action. Is any microbicidal effect whatever obtained in laboratory experiments with such weak solutions of mercurial salts that even the strength is no longer known, and the most delicate tests are necessary to reveal its presence?

As I am in no way in favor of the doctrine of Hahnemann, and as, on the other hand, I still remembered the perfect tollerance of my patients, whom, as a result of Raehlmann's article on detachment of the retina, I treated with sub-conjunctival injections of salt water in the dose of a half or an entire syringe-full, I returned to large injections and employed sublimate in solution of $\frac{1}{2000}$. The therapeutic result has been so conclusive, as compared with that of weak injections, that doubt as to their rapid efficiency has not been tenable, either for me or for my pupils, who have carefully followed my work, and who have witnessed their surprising effects in a number of patients.

I have ordinarily injected half a Pravaz syringe-full, using the following formula:

Sublimate	0.015	gr.
Salicylate of eserine	0.05	gr.
Sterilized distilled water	30.	grammes.

The myotic is only replaced by atropine or scopolamine when the case is complicated with iritis, and the combination of the sublimate solution with a myotic has seemed to me to produce a more favorable action than the simple sublimate solution.

The injections are first performed daily, during from one to three days after preparatory disinfection of the lashes with a 1% solution of oxycyanide of mercury and irrigation of the conjunctiva with a 4% boric acid solution. In antiseptic occlusion, bandage for the eye completes the treatment. The intervals for the injections and the amount of fluid injected are regulated according to the improvement. Even in very advanced cases of suppuration of the cornea with hypopyon, only 6 or 8 injections are necessary to obtain recovery with clearing up of the diseased portions.

In glancing over Nagel's *Transactions* for the year 1893 I was struck with the almost identical conclusions of two of my Italian colleagues, Sgrosso and Scalenci, based on extensive clinical and experimental work: "*Sub-conjunctival injections,*" say my colleagues, "*are of the greatest* (*grandissima*) *utility in corneal ulcers, even the graver ones, but of slight or no utility in non-septic inflammatory diseases of the cornea and the other membranes of the eye.*"

This was so far in accord with my results that I did not endeavor immediately to inform myself whether a method similar to mine had been used at the Naples clinic, for the simple reading of the *Transactions* gave me no information in this respect.

The reading of an original article published in the third volume of the report of the Naples clinic (1) informed me that in the practice of de Vincentiis large injections of a half to three-quarters of a syringe-full are used, and "in grave cases an entire syringe-full is injected in two or three different points of the conjunctiva near the cornea, in order to avoid gangrenous destruction of the conjunctival tissue from the great distention of the conjunctiva which has sometimes occurred."

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(1) Le injezioni sotto congiuntivali ed intra tenonione di sublimato corrosivo. *Labori esequetti nella Clinica Oculistica di Napoli*, Vol. III., 1893.

At Naples, a $\frac{1}{2000}$ solution was preferred, and in some cases, a $\frac{1}{1000}$, using the formulæ of Secondi, in which there is an addition of chloride of sodium (1).

In using exclusively solutions of $\frac{1}{2000}$ I have never seen mortification of a portion of the conjunctiva, severe pains, or œdema of one or the other lid, accidents described by my colleagues as "almost constant."

Far from that, these injections have seemed to be scarcely painful, if the eye was well cocainized; they have an undoubted calming action. Patients with large ulcerations of the cornea have recovered sleep, of which they had been deprived from the commencement of their disease, and almost all spoke of the *great relief* produced by the injections.

A more noticeable difference between the method employed at the Naples clinic and mine is that I have given 2 to 3 injections as a minimum in severe cases, while my colleagues state that in 46 cases a single injection was sufficient. It is indisputable that the number of injections of large doses is very much reduced in comparison to the number required with small doses. Dr. Darier tells us (see *Annales d'Oculistique*, Vol. CIX., p. 241) of from 50 to 60 injections every two or three days, not, it is true, for ulcerative affections of the cornea in particular.

What forms the original side of large injections, such as I have employed them, is that, with the exception of a few rare cases in which I have combined them with curetting of the ne-

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(1)

Sublimate	0.05	grammes.
Chloride of Sodium	0.10	"
Distilled water	100.	"

(In a sterilized bottle.)

or:

Sublimate	0.05	"
Chloride of sodium	0.10	"
Distilled water	50.	"

(In a sterilized bottle.)

crosed portions of the cornea, they have constituted the only form of treatment used in destructive affections of the cornea, frequently far advanced, and keratotomy, the actual cautery, paracentesis, etc., have never been employed.

But such has not been the case with those who have preceded me in this kind of treatment, as is clearly shown from a passage in an article which appeared last month by Dr. Mellinger (1). This colleague says expressly: "Secondi (2), who, as Reymond's assistant, was the first to recommend sub-conjunctival injections of sublimate in destructive processes of the cornea, used, besides, especially in keratitis with hypopyon, quite varied forms of treatment. Wherever injections of sublimate have been used for this class of affections of the cornea, the usual methods of treatment, consisting of the use of atropine, irrigations, bandaging, and moist heat, have been preserved. On this point compare the articles by Darier (3), Matarrugas (4), Gepner (5), Van Moll (6), Oetken (7), etc. Sub-conjunctival injections," adds Dr. Mellinger, "should not and cannot ever represent the only method of treatment in destructive processes."

On the other hand, in my practice, occlusion of the eyes and large sub-conjunctival injections have been the *only method* of treatment employed in a large majority of destructive affections of the cornea, and therefore to them alone can the curative power be attributed.

It is of slight importance whether this is due to antisepsis or to acceleration of the lymph current in the cornea, or, finally, to the circulatory modifications which occur, all influences whose quantitative action it will never be possible to verify.

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(1) Zur Frage der Wirkung sub-conjunctivaler injectionen. (*Klin. Monatsblätter*, April, 1895.)

(2) Le injezioni sotto congiuntivali di sublimato corrosivo, etc. Pavia, 1891, p. 84

(3) *Archives d'Ophtalm.*, 1891.

(4) *Paris Thesis*, 1894.

(5) *Centralblatt f. Augenheilkunde*, Jan., 1894.

(6) *Klin. Monatsbl.*, 1892, p. 329.

(7) *Kiel Thesis.*

ON HEREDITARY NYSTAGMUS

By Dr. **H. AUDEOUD,**
Physician to the Polyclinic of the University of Geneva.

I have observed at the Children's Hospital a young girl with nystagmus dating from early infancy, and have found several other similar cases in her family. As this is not of frequent occurrence, I thought it would be interesting to give a detailed description of the case. My thanks are due to Dr. Martin, who has given me every facility in making my observations.

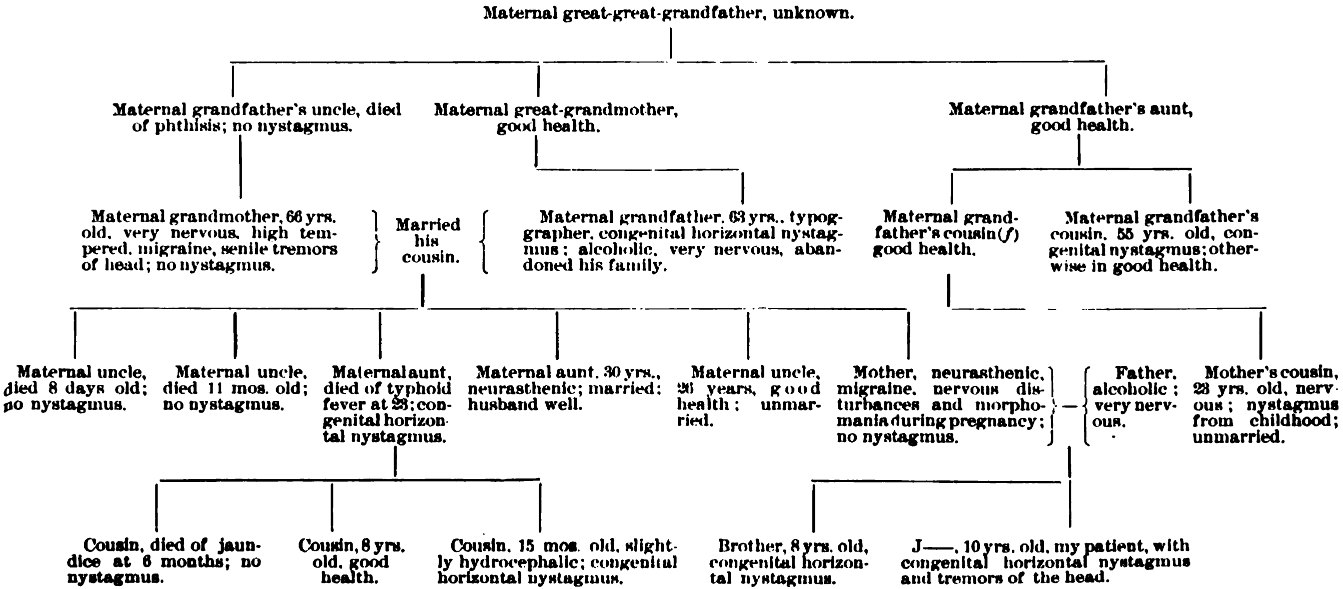
The patient was a child ten years of age, treated at birth, as the mother said, for an ophthalmia. She could have had no previous disease. She had had trembling of the head from early infancy, for which she was brought to the Children's Hospital on July 13, 1894. She was an intelligent, wide-awake child, and could sew and read easily. There were horizontal arhythmic oscillations of the head, which ceased during sleep and were diminished by exertion of the will. This was rather a movement of rotation than a properly called trembling. This condition frequently accompanies nystagmus, and such was the case here; there was, in fact, very marked horizontal nystagmus in both eyes. Vision, which was diminished, was in both eyes ⅛ of the normal. The pupils were equal, and reacted perfectly. The motility of the eyeballs was normal, except for the nystagmus. There was no hemianopsia. Ophthmalmoscopic examination, made by Dr. Sulzer, showed that the transparent media were intact, but there was a partial atrophy of both papillæ, more marked in the right than in the left eye, secondary to an old optic neuritis.

As for the extremities, there were slight shaking movements in the hands and feet. Sensation and the reflexes were normal, as well as speech. The respiratory, digestive, and circulatory systems, and the urine, were normal. As treatment, antipyrine in doses of 0.25 to 2.50 gr. daily, combined with cold douches, was first tried; then bromide of potassium 0.50 to 2.50 gr.; finally, sulphate of atropine ¼ to 1 milligramme, without obtaining any result, as might have been expected.

The most interesting fact in connection with this patient was her hereditary antecedents. It was, in fact, found that there had been in this family, *on the maternal side,* no less than six other cases of

GENEALOGICAL TABLE.

Showing 7 cases of nystagmus in three generations of one family.


Maternal great-great-grandfather, unknown.
Maternal grandfather's uncle, died of phthisis; no nystagmus.
Maternal great-grandmother, good health.
Maternal grandfather's aunt, good health.
Maternal grandmother, 66 yrs. old, very nervous, high tempered, migraine, senile tremors of head; no nystagmus.
Married his cousin.
Maternal grandfather, 63 yrs., typographer, congenital horizontal nystagmus; alcoholic, very nervous, abandoned his family.
Maternal grandfather's cousin (*f*) good health.
Maternal grandfather's cousin, 55 yrs. old, congenital nystagmus; otherwise in good health.
Maternal uncle, died 8 days old; no nystagmus.
Maternal uncle, died 11 mos. old; no nystagmus.
Maternal aunt, died of typhoid fever at 28; congenital horizontal nystagmus.
Maternal aunt, 30 yrs., neurasthenic; married; husband well.
Maternal uncle, 26 years, good health; unmarried.
Mother, neurasthenic, migraine, nervous disturbances and morphomania during pregnancy; no nystagmus.
Father, alcoholic; very nervous.
Mother's cousin, 23 yrs. old, nervous; nystagmus from childhood; unmarried.
Cousin, died of jaundice at 6 months; no nystagmus.
Cousin, 8 yrs. old, good health.
Cousin, 15 mos. old, slightly hydrocephalic; congenital horizontal nystagmus.
Brother, 8 yrs. old, congenital horizontal nystagmus.
J——, 10 yrs. old, my patient, with congenital horizontal nystagmus and tremors of the head.

N. B.—The word congenital here indicates the beginning in the first months of life.

ystagmus which dated almost from birth and had lasted through fe. In these persons it was also found that there had been a tremling of the head which had lasted for a longer or shorter period, as n my patient. The six relatives thus affected were the following : brother eight years old, a cousin eighteen months old, an aunt ho died at twenty-three years of age, the grandfather, sixty-three ears of age, a cousin of the latter, and a cousin of the mother—*all*, repeat, *in the maternal line.*

Such a family should also present nervous stigmata, and such ndeed was the case. The cousin who was affected with nystagmus ad hydrocephalus. The mother and an aunt were neurasthenic. he grandfather, who had married his own cousin, was an alcoholic f bad character, and who had abandoned his family. The grandmother as high-tempered, and suffered from migraine. Two cousins of the randfather were epileptic.

If, now, we turn to the paternal hereditary line of this patient, we nd that the father is high-tempered, alcoholic, and brutal; an ncle is an alcoholic; the grandfather was insane and committed uicide; of three great-uncles, one had been insane, another had ommitted suicide, and the third is extremely peculiar; the great-randmother was an alcoholic and insane; finally, a cousin had inantile hemiplegia. This, then, is an heredity sufficiently charged ith stigmata.

In considering this nystagmus, which was common to *seven* nembers of this family, the question arises as to what was its ause. In my patient it was evidently not symptomatic of erebral traumatism, hemorrhage or softening, of tubercular neningitis, of a tumor or multiple sclerosis. Nor did the cause eem to be muscular, as in miners' nystagmus. Finally, it had o relation to defective development of the eyeballs, nor to a loss of transparence of the cornea, the lens, or the vitreous umor, nor did it depend upon a disease of the iris or the horoid. All these causes being eliminated, there remains the ld optic neuritis, traces of which could still be seen. This alone is not a sufficient explanation, since so many cases of optic neuritis have no nystagmus. But, considering the strong family predisposition, is it not possible to think that a neuritis, xisting perhaps at birth or shortly after, had been the determining cause of the nystagmus in this child?

Let us consider the other members of the family.

1st. E——, *her brother*, eight years old, had been troubled with horizontal nystagmus and trembling of the head since the age of three months, according to the mother's statement. The latter was increased by joy or emotion. This child had had whooping-cough at the age of three years, measles at three and a half years, and pneumonia at six years, and these diseases had had no influence on the anterior disease. I find now a horizontal nystagmus similar to that of his sister; there is no ocular paralysis; the pupils are equal and react normally; vision is $\frac{1}{2}$ in the left eye and $\frac{1}{3}$ in the right, but there is neither hemianopsia nor dyschromatopsia. The transparent media are intact, and *the fundus is normal.* This child has never been troubled with his eyes, and is otherwise in perfect health.

2d. J——, eighteen months old, was *her cousin.* He had always been weak and sickly. When he was three or four months old those about him had noticed that he also was affected with nystagmus, and at this time there was also noticed a trembling of the head, which soon disappeared. Now, vision, as far as can be judged at that age, is good. The horizontal nystagmus is slight. *The fundus in both eyes is normal.*

3d. A——, twenty-three years old, was a distant cousin of my patient, since he was only the *son of her grandfather's cousin.* His sight had been bad from childhood, but it was not till he was between eight and nine years old that his mother noticed that he had nystagmus. Trembling of the head appeared at the same time. This young man had been rejected for military service on account of this infirmity, although he was not a bad shot. He enjoyed good health, and was an enthusiastic and expert bicycle rider. Examination showed that he had a high degree of horizontal nystagmus and marked trembling of the head. He had no voluntary influence over the latter. His head shook when he worked, and when his sight was fixed on an object. Vision was $\frac{1}{4}$ in the left eye and $\frac{1}{3}$ to $\frac{1}{4}$ in the right; he was emmetropic; had no astigmatism; color vision was normal; fusion of images and stereoscopic vision persisted in spite of the nystagmus, a fact which is not usual. Movements of the eyes were easily performed in all irections. Pupil reactions were normal. The transparent nedia were intact. *The fundus of both eyes was normal.* Nothing abnormal was found in the circulatory, respiratory, r digestive systems. The urine was normal.

4th. M——, fifty-five years old, was the *cousin* of my atient's *grandfather.* He told me that his nystagmus dated rom birth, but that his sight and his general health had always een excellent. Although he had been rejected for military ervice, he was an amateur shot. His nystagmus was slightly narked. It had been greater in his youth, when it was acompanied with trembling of the head like that in the other nembers of the family, but this trembling has now almost enirely disappeared. In 1891 he came to Prof. Haltenhoff's linic, and there a decided astigmatism was found in both eyes. Accommodation is now very slight, without manifest hypernetropia. His presbyopia = 3 D. Vision in both eyes is $\frac{6}{18}$ without correction and $\frac{6}{12}$ with correction. The nystagmus, which is noticeable, is increased to the maximum when the atient looks to the left.

Another examination, made on February 20, 1895, by Dr. Sulzer, showed the following: horizontal nystagmus; when he patient fixed his sight on an object placed before him, light, slow horizontal movements were noticed, interrupted y short stops just in the position of fixation. The motility f the eyes was normal. In the extreme lateral positions the novements of nystagmus became larger and more rapid. The atient, who is a hunter, has noticed that he aims more easily pward than downward. The periods of cessation of the ystagmus are, in fact, more readily produced when the patient s looking upward. Vision is $\frac{5}{30}$ in the left eye and from $\frac{6}{30}$ to $\frac{5}{0}$ in the right. It is $\frac{5}{15}$ in both eyes after the correction of n astigmatism of 1 D. On ophthalmoscopic examination the apillæ appear slightly gray, but of normal aspect, considering he age of the patient. The visual fields and color perception re normal. An interesting fact is that the patient complains f gaps in the outlines of the letters of Snellen's test types.

5th. The *maternal grandfather* also had nystagmus, but he bandoned his family, and no one knows what became of him.

As for the *maternal aunt*, she also had nystagmus, but died several years ago, of typhoid fever.

Thus, in short, in 5 cases of nystagmus the fundus of the eye was found to be normal in 3 cases, in 1 a partial atrophy of both papillæ was found, and in 1 the papillæ were almost normal; in 3 cases the vision was below normal, without explanation from any ocular lesion.

What conclusion can be reached, except that the nervous system played an important part ? But what exactly was this part ? Of this I am now ignorant, but one may consider dissimilar or similar nervous affections, as in this case, as arising from some hereditary localized sclerosis in some part of the brain.

In this connection the following lines may be quoted from an article by Legrand du Saulle on "Hereditary Insanity" (1873, p. 81): "Nystagmus does not appear as frequently in persons with mental affections as in their descendants. It is not rare to see very intelligent persons with nystagmus, some of whose antecedents were neurotic or insane, without being thus affected themselves. Nystagmus is a mark of pathological heredity. It is a defect which rarely exists isolated, and which is found in connection with many other physical signs (asymmetrical facial tics, etc.). Evidently it cannot be said that a person with nystagmus is destined to lose his reason. We can simply say that nystagmus is one of the signs of cerebral heredity, and that this peculiar condition is almost always met with in those who are descended from families which are unsound from the mental point of view."

I have found very little in literature in relation to hereditary nystagmus. Doumic (1) mentions the case of a brother and sister, both of whom were albinos. Nettleship (2) describes a monocular nystagmus in three brothers in whom the same eye was affected in all. Owen (3) and Wood (4) also report cases, but I have been unable to find a case similar to that which I have described.

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(1) *Union médic. de Paris*, 1858, p. 439, and *Bull. Soc. chirurg.*, 1858–59, p. 79.

(2) *Ophth. Hosp. Rep.*, London, 1886, Vol. XI., p. 75.

(3) Picture of Hereditary Nystagmus. (*Ophth. Rev.*, London, 1881–82, p. 239.)

(4) Picture of Hereditary Nystagmus. (*N. Am. Practitioner*, Chicago, 18[illegible] *IV.*, p. 179.)

CLINICAL NOTES

TRAUMATIC PARALYSIS OF THE EXTERNAL RECTUS MUSCLE FROM A CONTUSION OF THE MASTOID PROCESS OF THE SAME SIDE

By Dr. **H. ARMAIGNAC.**

Paralyses of the muscles of the eye, either exterior or interior, as the result of a traumatism, are not rare, but they may depend upon various circumstances. Thus, a distinction may be made between the cases in which the muscle itself is injured by the traumatism, those in which it is affected only indirectly or by contre-coup, and those, finally, in which the lesion occurs in the course of the nerve which supplies the muscle.

In the first category may be classed direct contusions or injuries of the eyeball or of the walls of the orbit. In the second are also contusions of various kinds which do not affect the muscle directly, but only the neighboring parts. For example, paralysis of the ciliary muscle is frequently observed as the result of a blow, at times very slight, on the anterior portion of the eye from a projecting branch of a tree, the cork of a champagne or sparkling water bottle, etc.

Finally, in the third category, the lesion does not affect the muscle, but only the nerve which supplies it, and in this case either a rupture or tearing of the nerve is found, as in the case of fracture of the petrous portion of the temporal bone, the walls of the orbital foramen, or the sphenoidal fissure resulting from a fall on the head, an injury from a fire-arm projectile, etc. In still other cases the nerve trunk is not injured, but is slightly compromised by a hemorrhage which occurs either in its sheath or in its vicinity.

In all cases the traumatism must be sufficiently severe, and paralysis of one or of several ocular muscles is frequently the only symptom which leads to a diagnosis of internal lesions.

All the muscles of the eye, either in groups or singly, may thus be paralyzed, but the external rectus seems to be most frequently affected from injuries of the base of the skull, as Dr. Panas has observed. The reason for this is simply anatomical.

In fact, while in its first portion, extending from the eyeball where it emerges to the posterior surface of the petrous portion of the temporal bone where it traverses the dura mater, the external oculo-motor nerve is distant from the bone from which it is separated by the arachnoid and the pia mater, in its second portion, on the other hand, it forms a vertical loop with antero-external concavity which surrounds the petrous portion of the temporal bone and closely embraces its superior angle near the apex.

Nothing separates the nerve trunk from the bone except the peirosteum and, quite below, the inferior petrosal sinus. Throughout, the dura mater closes, and fixes the nerve against the temporal bone. It is not surprising, then, that this nerve is almost always involved in fractures of this bone which, as is known, most frequently affect its apex, and, in particular, its edge.

Cannot paralysis of the external rectus muscle occur without important lesion of the petrous portion of the temporal bone? Up to the present time the various cases published by authors would seem to lead to this belief, but the case which I shall describe will show, I hope, that this is not always so.

The case was that of a lad, fifteen years old, who, while running, fell so that the external surface of his left mastoid process was thrown against the edge of a comrade's tibia.

Scarcely had he got up when his companions noticed that he squinted inward with the left eye. The boy himself observed only a fairly marked diplopia, which increased when he looked to the left, and a slight headache, which disappeared during the following night.

The boy was brought to me the day after the accident. His general condition was perfect; the headache of the day before had disappeared, and there was only slight pain in the fundus of the orbit, but there was a convergent strabismus of the left eye with absolute impossibility of moving the eye outward.

All the other muscles of the eye functionated normally. Vision, at both far and near points, was perfect on correcting a slight amount of myopia, equal in the affected eye to 0.75 D. The vision in this eye was even greater than in the right, in which, it is true, there was double the amount of myopia. The only visual disturbance of which the boy complained was the diplopia, which was quite troublesome at far points, but less decided in near vision. Furthermore, objects appeared slightly yellow with the left eye. There was nothing abnormal in the auditory apparatus, and no trouble in hearing, and there had been, at the time of the accident, no hemorrhages from the ear, or general disturbances, such as vertigo or vomiting.

The most careful ophthalmoscopic examination revealed absolutely nothing abnormal in the fundus of the eye.

The contusion of the mastoid process must have been quite severe, for there was a large scab which had resulted from grazing the skin.

In the absence of severe general symptoms, the paralysis of the external rectus indicated that some serious disturbance had been produced somewhere in the course of the nerve, and therefore I thought it prudent to prescribe absolute rest, diet, and foot-baths.

After a few days the general condition still remained perfect, but the paralysis did not diminish, and so I tried faradic electricity several times over the paralyzed muscle.

As the patient bore them very well, and as the eye commenced to move a little outward, I continued the application of electricity to the external rectus three or four times a week.

As a result of this treatment, which I have continued to the present time to the exclusion of everything else, the boy resumed his studies in fifteen days, and the paralysis has progressively disappeared. Now the mobility of the left eye outward appears to be as extensive as that of the right eye, but in reality there is still some disturbance in the function of the external rectus muscle, for there is homonymous diplopia at a distance corresponding to a strabismus of 5 or 6 degrees in extreme abduction. In fact, fusion of images is obtained placing before this eye a prism of 10 or 12 degrees with the base out.

On intentionally interrupting the electrical treatment for five or six days, I noticed that during this time the paralysis remained stationary. As soon as I again applied electricity to the muscle the improvement resumed its regular progress, and complete recovery will soon be obtained.

From the technical standpoint, it will be recognized that direct application of electricity to the muscles of the eyes is a method very little used. As a rule, a large, moist electrode is applied to the closed lids, and the current most frequently used is the continuous current, with an intensity of 4 or 5 milliampères.

I have often used electricity in paralysis of the ocular muscles, but the only current which has given me really successful results is the faradic current, obtained with a small induction coil.

I have sometimes used a bi-polar electrode obtained by uniting two isolated metallic wires on one handle, which are terminated at one extremity by a little ball which is enveloped with moist cotton, and the other extremity of which is connected with one of the rheophores. More frequently, and it was so in the case which I have described, I have employed a small uni-polar electrode. It is, like the other, a metallic wire with enlarged extremity, a simple pin, the head of which is enveloped in cotton and moistened when it is to be used, and which I apply directly to the bulbar conjunctiva over the paralyzed muscle after instilling two or three drops of a 3% solution of cocaine between the lids. The other electrode, with a large surface, is held in the hand by the patient or applied to any part of the body. I pass the current during five or six minutes, and graduate the intensity by means of a rheostat, so that it is easily borne by the patient.

And now, to return to the case which I have described, what occurred in the course of the sixth nerve at the time of the violent blow on the mastoid process? Was there simply a violent disturbance of the nerve, or was there a hemorrhage, and if so, at what point?

It was certainly not in the vicinity of the sphenoidal fissure or the posterior pole of the eye, for in that case other nerves than the sixth would have been involved, and vision would have suffered, as the hemorrhage would have exercised the same compression on the other nerves, and on the optic nerve, which is so near them.

Neither do I think it possible that the hemorrhage occurred in the intra-cranial portion of the nerve, as in that case general symptoms would have been observed more severe than the slight headache from which the lad suffered for a few hours.

In eliminating this portion and the anterior portion beyond the sphenoidal fissure there remains only the median portion of the nerve trunk entirely included within the cavernous sinus. It is in this portion that the nerve is in most intimate relation with the petrous portion of the temporal bone, the superior angle of which it surrounds near the apex, being only separated from the bone by the periosteum. If there was a hemorrhage, it is there, I think, that it should be localized, for it could occur in the nerve sheath without producing any other results than a temporary paralysis of the nerve.

In fractures of the base of the skull, accompanied so often, as is known, with paralysis of the external rectus, it is generally in this region where the sixth nerve passes that the fissure of the temporal bone occurs. In the case described there was evidently no fracture, and the hypothesis of a small hemorrhage seems to me to be the only possible theory, unless it might be considered that the disturbance of the nerve by contre-coup was sufficient to bring on the paralysis without producing any lesion of continuity or contiguity. In any case, he fact is none the less curious, for the traumatism, it must be said, was only of relative violence.

II.—REPORTS OF SOCIETIES

SOCIETIES

OPHTHALMOLOGICAL SOCIETY OF PARIS

Session of June 4.

Ocular Diphtheria and Sero-therapeutics.

DR. A. TERSON.—It is now known that diphtheritic conjunctivitis, in both severe and benign forms, has for its cause the bacillus of Loeffler and its associates. Although it would be useless to consider the presence or absence of the bacillus of Loeffler a cause of benignity or malignity, yet bacteriological examination is necessary to discover the microbial associates—the association with the streptococcus seeming to be the more grave—to prove the presence of the bacillus of Loeffler, and in such case to institute general diphtheritic prophylactic treatment, and, finally, to study the virulence of the microbes involved, as the bacillus may be absolutely neutral in the pseudo-diphtheritic form.

On the question of bacteriological diagnosis Dr. Morax (see April number, p. 238), reports some interesting cases concerning: 1st. A child six years old with benign pseudo-membranous conjunctivitis, in whom the bacillus of Loeffler was found in pure and very virulent form ; rapid recovery from diphtheritic conjunctivitis and tonsillitis after several injections of Roux' serum. 2d. A child several months old, with pseudo-membranous conjunctivitis, in whom were found virulent bacilli in association with the streptococcus and staphylococcus aureus : recovery after a single injection of Roux' serum (10 c. c.).

Morax also reports two rare cases : one, a case of pseudo-membranous conjunctivitis with the bacillus of Weeks and the diphtheritic bacillus ; the other, a case of pseudo-membranous conjunctivitis of very severe type (von Græfe) containing pure streptococci. This last case shows that the name of diphtheria should not be continued for severe forms of conjunctivitis with false membranes, since they may be produced by other microbes without association with the diphtheria bacillus.

Morax thus makes his contribution to sero-therapeutics in ocular diphtheria with his two very favorable cases. There are now 7 cases which have been thus treated, all of which have given good results

H. Coppez, Desseaux, Morax, and Jessop). The sero-therapeutic nethod will then be fulfilled in such cases by following the last intructions of Roux. The local treatment, irrigations of the culs-de-ac (with diluted Labarraque's solution, etc.), is applicable to the ssociate microbes, but seems to be useless in cases where the bacillus s in the pure state. Sero-therapeutics seems also to be of value in liagnosis from its specific action, and a preventive injection may e made on every person with pseudo-membranous conjunctivitis, nd even on those persons about him. It has not yet been shown hat it has any action on the other accidents of diphtheritic origin, uch as ocular paralysis.

ontribution to the Study of Lesions of the Papilla and of the Optic Nerve in Cerebral Tumors.

DR. PARINAUD.—(This report on the work of Dr. Rochon-Duigneaud will be published in full.)

Dr. Antonelli.—I should like to call to Dr. Parinaud's attention n article by Prof. Scimemi. He has performed experiments on ntra-cranial pressure, and his results corroborate those of Dr. Parinaud.

Dr. Koenig.—Cerebral tumors may cause a great variety of lesions: ongestion of the disc, simple atrophy, neuritis with œdema limited o the disc or extending to the neighboring parts of the retina. Has Dr. Rochon-Duvigneaud studied the different clinical aspects of these lesions?

Dr. Abadie.—The causes of the neuritis which accompanies cerebral tumors are probably multiple, and the infection theory of Deutschmann and Leber, which seems to me to be one of the best established, cannot be ignored. If we look at the facts as they are observed in practice it will be seen that trepanation may cure optic neuritis, and I consider this rather an argument in favor of the infection theory; the action of the trepanation may be likened to the action of laparotomy in tubercular peritonitis.

It seems to me that the infection theory cannot be abandoned, and that the therapeutics of the future will be directed against infection.

Dr. Galezowski.—Dr. Parinaud's report is very interesting, and I think, as he does, that Deutschmann's ideas are false and dangerous. Microbes do not explain everything, and we know, for example, that the neuritis which sometimes accompanies tubercular meningitis may be completely cured. It is hardly probable, therefore, that this is a microbial lesion. The study of the lymphatic canals of the optic nerve is of great importance, and by this means we will reach a solution of this question.

Dr. Parinaud.—I would reply to Dr. Abadie that I do not think the theoretical side is to be abandoned, for in the diagnosis of a cerebral disease neurologists frequently ask us the significance of neuritis, and if the mechanical or infection theory is followed a false course will surely be taken. Œdematous neuritis has very distinct characteristics; that which we have been studying is always easily differentiated by the fact that it is bilateral, from the absence of accord between the lesions, which are frequently enormous, and the visual disturbance, which may be scarcely noticeable; vision may be preserved for years in spite of large ophthalmoscopic lesions. In lesions of the base evidently different forms of neuritis may be observed. The neuritis of meningitis and that of cerebral tumors are identical, although at first several slight differences may be noticed.

Syphilis of the Lid Cured by Treatment with Iodide of Potassium Alone, and Followed by Cerebral Complications Which Resisted Treatment with Iodide and Mercurial Inunctions but Were Cured by Hypodermic Injections of Cyanide of Mercury.

Dr. Abadie.—This detailed case, due to Dr. Dubarry (Havre), relates to a patient whose initial syphilitic lesion had passed unperceived. In his past history it was simply found that he had contracted tonsillitis during his military service in 1870: perhaps this was a chancre of the tonsil. He had had no secondary lesions, and had not been subjected to specific treatment. He was married, and his wife had had sixteen pregnancies all terminated at term, but many of the children had died in early infancy, a fact which might favor a diagnosis of syphilis. Twenty-two years after the supposed initial lesion he was attacked with an ulceration of severe and progressive form on the lower lid of the right eye. At the same time he was seized with epileptiform attacks followed by coma, from which he recovered, with a certain amount of physical and cerebral lassitude.

He had undergone no treatment, and when Dr. Dubarry saw him for the first time the ulceration had destroyed the greater part of the lower lid and had attacked the upper. The general health was good. At first 6 and afterwards 8 grammes of iodide of potassium was prescribed daily. After four days there was already a noticeable improvement, and in fifteen days the ulceration was completely healed. In spite of the healing, the treatment with iodide was continued, and he was also subjected to mercurial inunctions. Two months afterwards cerebral disturbances again appeared: embarrassment of speech, returning epileptiform seizures, paresis of the lower extremities, gâtisme, and then intellectual disturbances. The patient was then treated with sub-cutaneous injections of cyanide of mercury in 1% solution. After the fifth injection the improvement was already manifest, and in five months the cure was perfect.

This is one more case in support of the superiority of sub-cutaneous injections of mercury.

Pseudo-membranous Conjunctivitis with Pure Streptococci; Ill Success of Anti-diphtheritic Serum.

DR. DARIER.—New-born child with ophthalmia on the fifth day. Cauterization with 2% nitrate of silver and irrigation with permanganate of potash. Two days after, false membranes appeared. Dr. Budin prescribed, in addition to the above treatment, cauterization with lemon juice every three hours.

Examination of membranes: Pure streptococci; injection of 6, 7, and then 8 c. c. of Roux' serum. Improvement the first two days, then sudden aggravation and total loss of both corneæ.

Was it the nature of the infective agent which caused the excessive malignity of this case?

Up to the present time cases of diphtheritic conjunctivitis have all been cured by the serum treatment, but no case has been described in which the streptococcus alone was the cause.

I think that in the prognosis of ocular diphtheria, even when treated with serum, one should take into consideration: 1st, very young patients (the new-born); 2d, the precocity and extent of the corneal lesions; 3d, participation of the bulbar conjunctiva in the diphtheritic process; 4th, the predominance or exclusive power of the streptococcus, in which case it would be proper to try anti-streptococcic serum, which is not easily found.

Dr. A. Terson.—I should like to communicate to you, in the name of my colleague Sourdille, the following case of non-diphtheritic false membranes treated with serum. A girl, twenty-six months old, was brought to the Hotel Dieu about the middle of the month of May. The lids of both eyes were swollen, indurated, and discolored; the palpebral conjunctiva was covered with a grayish adherent false membrane, which was not removed by friction. Before any bacteriological examination was made 10 c. c. of Roux' serum was injected. Examination on plate cultures revealed the presence of gonococci in great abundance. The cultures were negative from the diphtheritic point of view, and only colonies of white staphylococci developed.

The false membranes disappeared in about sixteen hours, but the conjunctivitis became distinctly purulent and continued its development. One cornea was perforated, and it was with great difficulty that perforation of the other was avoided, in spite of the use of nitrate of silver and permanganate of potash. The injection of serum does not seem to have had a beneficial influence.

Dr. Abadie.—In the case reported by Dr. Darier the progress of the disease was most unfortunate, and the question arises whether the injection of serum could have been harmful. We know, in fact, that the association of toxine produces far more serious effects. For ten years I have always employed lemon juice in diphtheritic conjunctivitis, and I have never seen a case develop in so grave a manner as that described by Dr. Darier. Bacteriology does not elucidate everything, and I think it a mistake to renounce the use of lemon juice.

Dr. Galezowski.—I have lately seen a child with ophthalmia who was treated with injections of sublimate, then with injections of serum, then with irrigations of permanganate of potash, and who was brought to me with advanced corneal lesions. This was simply an ophthalmia of the new-born, aggravated by treatment, and under the influence of cauterization with nitrate of silver twice daily a marked improvement has already resulted. Diphtheritic conjunctivitis is very rare, and in ophthalmia of the new-born, which is always identical, diphtheria should not be considered when there are false membranes. It would be proper to request the public authorities to forbid midwives to treat ophthalmia of the new-born. Blindness would then be very much diminished.

Dr. A. Terson.—It is quite certain, as I have stated in my report, that the presence or absence of the bacillus of Loeffler does not indicate either the benignity or malignity of the disease. However, independent of its usefulness from the pathological standpoint, bacteriological examination is very useful to determine whether the disease is really diphtheritic, a fact of great importance in prophylaxis, and to determine whether serum treatment should be employed, and what serum.

As for the pretended aggravating action of the injection, even in a non-diphtheritic case, it cannot be deduced from a single unsuccessful case, and if the efficacy of serum treatment is not completely established, its dangers are less so.

Dr. Abadie.—I have lately treated a child with a peculiar form of conjunctivitis with slight infiltration of the centre of the cornea. This child had had a diphtheritic tonsillitis, which was successfully treated with serum, and the conjunctivitis developed ten days after the recovery from the pharyngeal disease.

Dr. Vignes.—Serum injections and toxine injections should not be likened to each other, as Dr. Abadie has done; they are two essentially different things.

Dr. Darier.—Purulent ophthalmia of the new-born is frequently mistaken for diphtheritic conjunctivitis, because there may be false membranes. I am convinced of the efficacy of nitrate of silver, and I have protested against the use of Kalt's treatment. In the case which I described it could not be said that the injections of serum aggravated the progress of the disease, for in another case, in which false membranes developed as the result of too severe cauterization, and in which no diphtheritic bacilli were found, injection of serum had no harmful influence.

PHYSIOLOGICAL SOCIETY OF BERLIN

July 20, 1894.

On the Human Visual Purple and Its Role in Vision.

DRS. KOENIG and ELSE KOETTGEN.—The study of visual phenomena may be pursued by two different methods: the one objective, in which the anatomical and physiological modifications caused by light on the retina are observed. Boll and Kuhne have followed this method, and have made a special study of the visual purple. The second method, the subjective method, studies the sensations and the sensory variations by color comparison or other processes. These two methods have led to the discovery of certain facts, but the results have no relation to one another.

Koenig, by experimenting under new conditions, has endeavored to find relations between these facts, and his researches have been directed especially to the physiological analysis of achromatopsic eyes.

He first established the coefficients of absorption of human visual purple. He found that the coefficients of absorption were identical, in spectral distribution, with the value of stimulation of the different monochromatic lights for the limit of stimulation and for the sensation of light in total achromatopsia. There can be no doubt, therefore, that the sensation "gray" is caused by the transformation of the visual purple, and that in total achromatopsia the visual purple is the only photo-sensitive substance. The first objection which presents itself is that for weak intensities (or in achromatopsia for all degrees of intensity) the fovea should be blind, since it contains no purple.

Koenig has found : 1st, that with weak intensities (corresponding to the point where the colors of light disappear) the fovea is blind; 2d, that achromatopsic eyes are blind for all intensities at the fovea.

The transformation of purple produces visual yellow. The coefficients of absorption of visual yellow correspond to the spectral distribution of the sensation "blue." As there is no purple in the fovea, there should be no visual yellow there, and, consequently, the sensation blue would not exist. Koenig has found complete blindness for blue in the fovea. The following experiment may be performed : look at the moon through a blue glass ; if fixation is well sustained the moon will be no longer seen in the zone of fixation.

According to Koenig, the sensation which for weak intensities corresponds to gray is not quantitatively different from the sensation which for stronger luminous intensities corresponds to blue: there is only a physiological difference between them.

From all this, the photo-chemical substance for the fundamental sensation "blue" of the Young-Helmholtz theory must be found in the visual purple and in the products of decomposition.

III.—REVIEWS OF OPHTHALMOLOGICAL JOURNALS

Annali di Ottalmologia

Reviewed by Dr. PARISOTTI.

XXII. YEAR, No. 6.

I.—Criticism and New Interpretation of Hense's Entoptic Phenomenon, by Dr. BAQUIS.

This is an article in which the diagrams and formulæ are of more importance than the rest, and which, therefore, cannot be reviewed in a few words. It will be consulted with advantage by those who are interested in the subject of physiological optics. I will simply give the conclusions reached by Dr. Baquis.

When a luminous source is placed before the eye and is not directly fixed by the eye, three images may be seen instead of one :

1st. An erect image which is projected in the same region where the flame is found.

2d. An inverted image slightly enlarged, with very distinct outlines, which is displaced slowly in the opposite direction to the flame, and which makes excursions similar to those executed by the flame.

3d. An erect image very much enlarged, with indistinct outlines, which is displaced rapidly in the same direction as the flame, and the excursions of which become more and more rapid on going from the centre to the periphery.

II.—Micro-organisms of the Normal Conjunctiva,

by Dr. E. GASPARRINI.

DR. STADERANI has made a bacteriological study of the conjunctiva in more than a hundred healthy eyes of persons in very different conditions of life, from those in hospitals to those in the country.

He has made cultures on agar-agar and in beef-tea. The products were inoculated under the skin of rabbits, and sometimes the entire conjunctival secretion was injected under the skin. The search for the micro-organisms was made in the blood, either when the animal was dead or when it simply showed morbid symptoms. The author has found that the diplococcus of Fraenkel is far more frequent than the staphylococcus and the streptococcus.

Diplococcus of Fraenkel	8 times in 10
Staphylococcus pyogenes aureus	6 times in 10
Staphylococcus pyogenes albus	5 times in 10
Streptococci	15 times in 100

III.—Acute Dacryoadenitis of the Inferior Lobules of the Accessory Gland,

by Dr. A. ANTONELLI.

The author describes a case of this rare disease, and freely discusses the diagnosis.

I will give the symptoms which Dr. Antonelli describes as belonging to this affection. A small epibulbar tumor in the supero-external quadrant, which extends under the bulbar conjunctiva to a short distance from the corneal border and reaches below to the external palpebral commissure without passing it. The tumor has not a very distinct form, as the lower lobes are not contained in the capsule. The size of the tumor is that of a small pea, almost round in form, of irregular surface, and of hard, elastic, or molasses consistency. The tumor follows forced movements of the lid upward. Movements of the eyeball are not interfered with, and do not displace it.

No redness or swelling of the lid. Slight conjunctival chemosis limited to the superior external quadrant. The tumor descends almost to the external rectus.

EXTRACT FROM THE OFFICIAL BULLETIN OF THE SOCIETY OF OPHTHALMOLOGY.

(Congress of Palermo.)

Sub-conjunctival and Sub-tendon Injections of Corrosive Sublimate,

by Drs. SGROSSO and SCALINI.

The formulæ used were the following, given for the first time by *Secondi:*

Corrosive sublimate	5	grammes
Chloride of sodium	10	"
Sterilized distilled water	100	"

Corrosive sublimate	5	grammes
Chloride of sodium	10	"
Sterilized distilled water	50	"

Corneal Ulcers.—Recovery obtained with a single injection in 46 cases, with 2 injections in 8 cases; in 4 very severe cases with 3 injections. The quantity injected was from a half to three-quarters of a syringe-full distributed in two or three regions. In some very severe cases an entire syringe-full was used.

Syphilitic Affections of the Eye; Sympathetic Ophthalmia.—Against these diseases injections of sublimate have proved powerless as a means of prevention and treatment.

The truly surprising results obtained in ulcers of the cornea have led the authors to investigate the manner in which the sublimate injected under the conjunctiva reaches the cornea. From experiments which are described in the article, they are of the opinion that the sublimate reaches the cornea, the aqueous humor, etc., by the lymphatic canals. The best substance which they have employed to detect the presence of sublimate is chloride of tin.

On the Structure of Capsular Cataract, by Dr. ADDARIO.

From the results of the examination of two capsular cataracts, the author thinks that the substance which produces the cataract is formed between the lamellæ of the capsule. In fact, a pocket is found, covered on the posterior external surface with polygonal epithelium, which is lacking on the anterior surface. The pocket contains an amorphous fibrous substance which is, according to the author, necrosed lens substance. Scattered through this necrotic substance are fusiform elements with one or more nuclei which are, according to Dr. Addario, of epithelial nature, and are destined to regenerate the necrosed fibres of the lens.

Lesions of the Optic Foramen in Fracture of the Base of the Skull, by Dr. AGELLA.

Fractures were produced on the skulls of cadavers. Only fractures of the base of the skull which were linear and not comminuted were considered.

The results of the experiments may be thus summed up: in simple fractures of the posterior and middle region of the base of the skull the optic foramen is rarely involved.

Fractures of the anterior region involve the optic foramen in about two-thirds of the cases. Ordinarily the lesion is of the optic foramen of the same side; rarely, the other also is involved. In this case there is a doubling of the fracture in the neighborhood of the cribriform plate in exceptional cases; rarely, the optic foramen of the opposite side is injured, the fracture in this case crossing the cribriform plate without affecting the optic foramen on the same side. The direction of these fractures is almost the same in all cases. Some fractures of the posterior and middle regions, and about a third of those in the anterior region, may involve the sphenoidal fissure.

From observations make at Professor Angelucci's clinic, the author has been able to show that almost all fractures at the base of the skull are followed sooner or later by lesions of the optic nerve. In some cases the monolateral amaurosis affects the eye on the same side, very rarely the eye of the opposite side, and exceptionally, when the fracture of the base is lateral, both eyes have been attacked.

There may be tearing or laceration of the optic nerve from the fracture, and also displacement of the anterior clinoid process.

Congenital Hydrophthalmia, by Dr. Angelucci.

The patient was a child six years old, with tachycardia, frequent intermittence of the heart pulsations, and congenital hydrophthalmia in both eyes.

These heart disturbances have been observed by the author in all persons with congenital hydrophthalmia, with sometimes also valvular insufficiency and dilatation of the left heart, arterial hypertension, and subjective and objective sensations of heat on the head and face. In these cases the character is always emotional and high-tempered. These facts lead the author to think that hydrophthalmia is the result of vaso-motor disturbances, and still more so, as trophic disturbances are observed in such eyes.

Corneal Astigmatism After Cataract Operation in Relation to the Method of Operation and the Complications Occurring After Extraction, by Dr. Baiardi.

Flap extraction without iridectomy produces the highest degrees of astigmatism.

Anterior synechiæ and prolapse of the iris are the reasons for the astigmatism in the flap method without iridectomy. Sometimes an astigmatism is seen after operation which is inverse to that which is the rule in others.

A New Method of Tattooing the Cornea, by Dr. BAIARDI.

A discission needle is thrust into the cornea in the periphery near the portion to be tattooed. The point is pushed forward between the lamellæ of the cornea with pendulum movement, in order to make an interstitial space in the membrane. The needle is then drawn out, and through the same opening Chinese ink is introduced into the excavated portion with a small syringe.

Ocular Lesions in Diseases of the Liver, with a Contribution to the Study of the Nutrition of the Eyeball and of Sparkling Bodies, by Dr. MOAURO.

Xantopsia results from infiltration of the biliary pigment into the refractive media and the retina. The rarity of this phenomenon is explained by the inconstancy of the filtration of the biliary pigment into the interior of the eye, as is shown by experiment.

Hemeralopia does not depend upon jaundice; it is rather, as Dr. Parinaud has said, a weakening of the luminous sense from a lesion of the visual purple.

Secretion of the purple is altered by alterations in the blood, as is proved by tyrosine and cholesterine, which are found in the interior of the eyeball.

Elephantiasis of the Lids; Lymphangioma of the Palpebral Conjunctiva, by Dr. E. POLIGNANI.

The author has seen two kinds of elephantiasis of the lids. The first variety was soft and telangiectasic. The second was a cavernous lymphangioma of the palpebral conjunctiva in a trachomatous patient. In both cases the author has been able to find "vessel-forming" nodules, which have as yet only been studied by Baraban, and which are the origin of new lymphatic canals in continuation with pre-existing canals. He thinks that with this process of new formation there is a fusion and degeneration of the central element of the nodule, which is favored by the penetration of lymphatic cell elements.

Klinische Monatsblätter für Augenheilkunde

Reviewed by Dr. V. MORAX.

February.

.—Therapeutic Results of Sub-conjunctival Injections of Sublimate, by Dr. E. SCHULTZE.

Since the year 1892, when injections of sublimate were introduced nto ocular therapeutics by Reymond, and popularized by Abadie nd Darier, they have been frequently used at the Strasburg ophhalmological clinic. Schultze publishes the results obtained there.

In 3 cases of non-syphilitic central choroiditis sub-conjunctival njections produced very marked improvement. In one case of myopic choroiditis no change resulted. In 6 cases of disseminated choroiditis treated in this way 2 only were improved. In 6 cases of disturbances of the vitreous with choroidal lesions the disturbance n the vitreous was markedly diminished in 2 cases with this treatment. Improvement was quite marked in 2 cases of non-syphilitic chorio-retinitis. In 5 choroidal complications of myopia injections had no action. On the other hand, they were very active in different cases of retinitis and syphilitic neuritis. In two cases of retrobulbar neuritis the progress, otherwise favorable, was not influenced by the treatment. Good results have thus been obtained at Strasburg in diseases of the choroid, of the retina of the optic nerve, of the vitreous, and in irido-cyclitis.

II.—Correction of Myopia by Aphakia, by Dr. ED. PERGENS.

The author describes the results obtained from discission in 11 cases of myopia. No complication occurred. The loss of refraction produced by the operation varied from 14.5 D. to 18 D. The improvement in vision was very manifest, both for distant and near points.

III.—A Case of Suppurative Irido-choroiditis with Recovery and Complete Re-establishment of Vision, by Dr. ZIMMERMANN.

The patient was a man twenty-nine years old, with a history of three attacks of urethral blennorrhœa with blennorrhœic rheumatism, who had at present a urethral stricture. The last attack of gonorrhœa had occurred three years before the present ocular disease. This developed quite suddenly, with painful ocular symptoms and injection of the eye. On October 10, 1894, there was conjunctival chemosis, iritis with slight hypopyon, and some disturbance in the cornea. The tension was normal. The vitreous was somewhat clouded, and the fundus of the eye could not be seen. The patient scarcely saw fingers placed before the eye. After the first sub-conjunctival injection of sublimate and an instillation of atropine there was an improvement, followed in two days by a relapse. From that time the sub-conjunctival injections, with instillations of atropine, were repeated every day or two. After the tenth injection, twenty days after the beginning of the ocular disease, recovery was progressing rapidly, and the patient counted fingers at fifteen feet. The cloudiness of the vitreous disappeared progressively. and in two months normal vision was completely re-established ($V = \frac{15}{15}$).

The author attributes the infection to gonorrhœa, and thinks that this was a metastatic gonorrhœic irido-choroditis. It is needless to say that the recovery was due to the sub-conjunctival injections of sublimate.

IV.—**Irido-cyclitis Following Cataract Operation; Secondary Glaucoma; Sympathetic Affection of the Other Eye, and Secondary Glaucoma of That Eye,** by Dr. H. Merz.

In a case operated upon by Dr. Schiess-Gemuseus irido-cyclitis with secondary glaucoma developed two months after the operation, as the result of adhesion of the capsule to the lips of the incision. Eight days after, the other eye showed symptoms of sympathetic ophthalmia: exudative iritis, pericorneal injection, and headache. These symptoms were combated by enucleation of the eye operated upon and mercurial treatment. The sympathetic affection improved slightly, but there then occurred an elevation of tension, which was accompanied with symptoms of glaucoma: excavation and atrophy of the disk, narrowing of the visual field, while the symptoms of cyclitis disappeared completely. The author thinks that the patient was predisposed to glaucoma.

V.—**A Case of Phlegmon of the Orbit from Empyema of the Antrum of Highmore,** by Dr. H. Merz.

A man, twenty-six years old, had dental caries of the first molars of the upper jaw; as the result of this, empyema of the antrum of Highmore, then phlegmon of the orbit of the same side with optic neuritis. Drainage of the orbital abscess through the conjunctiva. Drainage of the maxillary sinus through the nose and the alveolar cavity after extirpation of the necrosed roots. Recovery.

March.

I.—On Several Subjective Visual Perceptions,

by Dr. W. VON ZEHENDER.

The persistent snows of a severe winter, such as we have just passed through, are particularly favorable to the study of a subjective visual phenomenon which occurs when one walks in the daylight through a country covered with snow. This phenomenon consists in the appearance in the visual field of a great number of brilliant spots, which move before the observer like a swarm of gnats. This perception has been compared to miniature fireworks. Purkinje has very carefully studied these subjective phenomena, and he distinguishes the brilliant spots from *muscæ volatantes*. Purkinje likens the brilliant spots to the light streaks produced by pressure on the eyeball, and supposes that this is an electrical process, with its seat in the nerve cell. As for *muscæ volatantes*, he states that they are produced by visible blood corpuscles in the interior of the eyeball. The difference between these two phenomena consists in their appearance and disappearance at the same spot, the brilliant spots only occurring in the light, and the *muscæ volatantes* being displaced from one point to another and appearing in the dark. Zehender likens the phenomenon of the brilliant spots to scintillating scotoma.

II.—On the Etiology of Detachment of the Retina,

by Dr. OHLEMANN.

The author describes a case of a patient, sixty years of age, emmetropic, who at harvest time was obliged to carry sacks of grain weighing from 60 to 65 kilogrammes, and who after carrying ten or a dozen sacks was suddenly seized with a disturbance of vision caused by detachment of the retina. The interesting fact in this case was the legal decision to which it gave rise. The patient claimed that the accident was caused by his work, and the tribunal upheld him. Ohlemann has found no cases with similar etiology in treatises on ophthalmology, and he thinks that the detachment was caused by a hemorrhage occurring between the choroid and the retina.

April.

I.—Etiology of Trachoma and Chronic Blennorrhœa of the Conjunctiva, by Dr. K. HORR.

From histological examinations, Horr arrives at the singular conception that trachoma and chronic conjunctival blennorrhœa are identical, and that the etiological agent is the gonococcus.

II.—On Subjective Visual Perceptions, by Dr. W. VON ZEHENDER.

Shadows of the Retinal Vessels and of the Entrance of the Optic Nerve.—The phenomenon of Purkinje is well known since that author has described it.

To perceive it, Purkinje gives several methods. The eyes may be closed and turned toward the sun, and the fingers are moved in front of the lid, so as to cause alternate shadow and light. The image of the retinal vessel will then appear progressively. Another method consists in keeping the eyes open and bringing the flame of a candle near the eye and passing it before the eye from side to side without fixing it. The candle may also be left at the side, so that the luminous rays fall obliquely on the eye. Finally, the eye may be strongly pressed, or a galvanic current passed through it. Such are the methods as indicated by Purkinje. Zehender has never succeeded in these experiments. On the other hand, he is able to see the shadow of the retinal vessel without any artifice. His first discovery of this was quite accidental. On awakening from a light sleep with an open book on his knees, the surface of which was white and well illuminated, he immediately perceived the image of the retinal vessel, and a dark spot corresponding to the disc of the optic nerve. Since then he has been able to repeat this experiment at will. Finally, in opening both eyes two images may be seen, corresponding to the two retinæ, and which, according to the convergence of the eyes, are separated from each other, or coincide. The subjective perception is produced in Zehender's experiment when he opens the eyes, after keeping them closed for a certain time; the image appears from the abrupt passage from shadow to light, and Zehender explains it by Hering's theory of the assimilation or disassimilation of white and black. Zehender has never perceived the movement of circulation, nor did Purkinje. The color of the shadow has always been black. On substituting colored paper for white paper Zehender has never been able to obtain phenomena of contrast.

III.—On Color Scotomata, by Dr. R. HILBERT.

Many observations of color vision are found in medical literature, but in these cases the color sensation extends to the whole retina. Cases of color scotoma are much more rare. Hilbert describes the case of a woman thirty-six years old who complained of photophobia and subjective scotoma. This scotoma was projected on all bright surfaces, and was of a reddish-yellow color. The patient had *lesions* of the choroid (atrophic foci with peripheral pigmentations).

The nature of this choroiditis could not be established, but the scotoma, slightly eccentric, corresponded to none of the choroidal focci. Two weeks later, the scotoma had assumed a gray color, and three weeks after that it disappeared. Perimetrical examination could not be performed. Hilbert has only found two cases, one of Szokalski and one of Williams, which were in any way similar to his case.

May.

I.—On Glaucoma After Cataract Operation,

by Dr. H. PAGENSTECHER.

Glaucoma may appear shortly after cataract extraction, or, on the other hand, a long time after it. But in the latter case the glaucomatous process cannot be attributed to the operative intervention. Pagenstecher has only studied cases which develop a short time after intervention, which was extraction, discission, and discission for secondary cataract. Symptoms of glaucoma may develop in eyes which had never before shown any symptoms of hypertonia, but frequently in eyes which had already had attacks of glaucoma. Glaucoma may appear during healing of the operative wound. Pagenstecher has found it in some cases, generally the first or third day after the operation, but after instillations of atropine. Glaucoma develops in the night with the symptoms of more or less pronounced pain, conjunctival injection, slight disturbance of the cornea, and hypertonia. The cicatrix may appear somewhat raised up, especially if there was a corneal flap. Repose in bed, warm applications, and internal administrations of salicylate of soda generally produce rapid cessation; if not, instillations of pilocarpine are given. As a rule, the tension returns to the normal in two or three days. Rarely, it is necessary to give sub-cutaneous injections of morphine.

Glaucoma may also be seen the second, third, or fourth week after the operation in eyes which have to that time shown no symptoms of irritation, in particular in eyes which, without escape of the aqueous, have presented marked hypertonia.

Sometimes, also, the hypertonia is accompanied with signs of iritis; the increase of tension is in general not very great, and atropine is indicated in these cases.

The cause of the glaucomatous phenomenon may be looked for in the swelling of the cortical masses, but glaucoma may also develop in the absence of lens débris in cases, for example, where the lens was extracted in the capsule. It is not caused by pinching a flap of th capsule. The prognosis is, in general, good, except in cases wher hypertonia is accompanied with serous iritis. It is, then, of advantage to perform paracentesis of the anterior chamber to restore the normal tension. Pagenstecher has only seen two cases in which vision was completely abolished a short time after the operation in consequence of glaucoma.

From these facts the practical lesson may be drawn that mydriatics should be used with prudence. When the iris is not inflamed, and if it reacts well to light, it is far better to avoid the use of mydriatics.

The symptoms of glaucoma which occur after discission of juvenile cataract, as a result of the swelling of the lens masses, are well known. They are combated by paracentesis and escape of the lens masses.

Glaucoma, as the result of discission, was mentioned by von Græfe twenty-six years ago. It is, in general, not rare to see slight attacks occur a short time after the operation. They are accompanied with pain and disturbance of the cornea. The more intense attacks are rarer ; but rapid glaucoma may occur. It is best to prescribe pilocarpine before discission, if there is no particular reason for using atropine. When the attack has developed, salicylate of soda may be used with great advantage. Pagenstecher was only obliged to have recourse to operation three times. This consisted in a puncture of the anterior chamber near the sclero-corneal limbus. The results of this anterior sclerotomy have been so favorable that Pagenstecher has never had occasion to employ iridectomy, as recommended by Knapp.

Iridectomy in these cases is frequently difficult to perform. It is difficult to seize the iris with the forceps, the vitreous escapes from the wound, and the reduction of the borders of the iris often presents very great difficulties.

Glaucoma, which occurs a long time after operation, is in no way peculiar. In this case, iridectomy is an important aid.

II.—On Winking as an Indication of Ocular Fatigue,

by Dr. R. KATZ.

Fatigue of the eye from reading is caused by excitation of the following apparatus :

The internal muscular, from accommodation.

The external muscular, from convergence.

The retina from the luminous rays, and the conjunctiva from caloric rays.

Exaggerated excitation of these apparatus produces asthenopia, which may be divided into muscular, accommodative, and retinal or conjunctival asthenopia. It may be asked if this subjective fatigue is shown objectively, and if it may be measured in any way. Fick has shown that winking is more frequent as the retina becomes more fatigued. In experiments performed with a registering apparatus Katz has found that in reading at a distance of 30 centimetres the number of winks per minute was 1.8 with electrical illumination, 2.8 with gas light, and 6.8 with weak illumination, which only permitted reading at 18 centimetres.

Consequently, the frequency of winking is an objective indication of ocular fatigue.

III.—**Pemphigus of the Conjunctiva,** by Dr. BORTHEN.

The author has had a patient seventy-four years old, with bullous lesions of the pharyngeal mucous and a conjunctival cicatrix with symblepharon, which he considers the remnant of a conjunctival bulla.

IV.—**A Case of Optic Neuritis from Stasis and Unilateral Paralysis of the Sixth Nerve in the Course of a Meningitis of Otic Origin,** by Dr. RAKOWICZ.

A child, eleven years old, attacked in 1893 with influenza with pulmonary and otic localization. Since then suppurative discharge from the right ear. In December, 1894, aggravation of the otitis media, headache, and fever. Rest in bed. After several days, improvement and appearance of diplopia. Ocular examination showed paralysis of the sixth nerve of the right side and a "Stauungspapille" in both eyes; $V = \frac{6}{20}$. Stacke-Schwartz operation (opening of the mastoid cells). The day after the operation the diplopia disappeared. Six days later, normal papilla and $V = 1$.

Recueil d'Ophtalmologie

Reviewed by Dr. DE BOURGON.

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August, 1894.

I.—**Glaucoma Is a Lymphangitis of the Eye Which Is Cured by Repeated Sclerotomies,** by Dr. GALEZOWSKI (*to follow*).

II.—On the Treatment of Ocular Diphtheria with Petroleum Oil, by Dr. Vian.

(See *Annales d'Oculistique,* Vol. CXXII., p. 122.)

III.—General Considerations of Cataract Operation in Children, by Dr. Dolard.

In this article, the last chapter of a thesis written under the direction of Professor Gayet, the author recommends operating for congenital cataract as early as possible, in order to avoid the inconvenience to the child of a bad optical education (myopia, strabismus, and nystagmus). In very young children extraction should be performed with complete chloroform narcosis.

In soft cataract superior kerato-kystitomy is the preferable method for extraction. In zonular cataract an optical pupil is generally made.

September.

I.—Treatment of Granular Conjunctivitis by Electrolysis, by Dr. Malgat.

(See *Annales d'Oculistique,* Vol. CXII., p. 136.)

II.—Double Spectacles with Superimposed Glasses for Patients Who Have Been Operated upon for Cataract and Hypermetropes, by Dr. Galezowski.

Persons with high degrees of hypermetropia who have reached a certain age, and those who have been operated upon for cataract, require two pairs of glasses, one for near and the other for distant vision. To obviate this inconvenience, Dr. Galezowski has, since 1887, had double spectacles made with superimposed glasses, which are of great service to the patients.

As the superimposed lenses soil easily, it is necessary to use rock crystal cut perpendicularly to the axis for the complementary lenses. With the exception of this slight inconvenience, which is easily avoided, these special spectacles are as easy to wear as others.

III.—Retrobulbar Neuritis from Late Hereditary Syphilis, by Dr. Vignes.

(See *Annales d'Oculistique,* Vol. CXI., p. 453.)

IV.—Glaucoma Is a Lymphangitis of the Eye Which Is Cured by Repeated Sclerotomies, by Dr. Galezowski (*to follow*).

V.—Note on Conjunctival Papilloma, by Dr. Saulay.

October.

I.—**Ophthalmological Studies,** by Dr. CHAUVEL.

Hypermetropia.—Hypermetropia complicated with amblyopia is not always hypermetropia of a high degree.

It is said that hypermetropia is always congenital, but the author is not quite convinced of this.

In 695 perimetrical examinations the monocular field of vision was more or less narrowed in 183 cases.

In 1126 cases of hypermetropia examined, only 22 had normal vision. Very frequently the lenses which improve vision are relatively weaker lenses, and in number far inferior to the degree of hypermetropia.

Astigmatism.—Regular astigmatism is frequent in hypermetropia.

II.—**Paralysis Associated with Upward and Downward Rotation,** by Dr. SAUVINEAU.

(See *Annales d'Oculistique,* Vol. CXII.)

III.—**Glaucoma Is a Lymphangitis of the Eye Which Is Cured by Repeated Sclerotomies,** by Dr. GALEZOWSKI (*to follow*).

November.

I.—**The Course of Clinical Ophthalmology,** by Dr. PANAS.

For the production of an ocular disease two conditions are necessary :

1st, the soil ; 2d, the seed.

From the point of view of the soil, the age, sex, and condition of nutrition of the patient must be considered ; from the point of view of the seed, either micro-organisms or toxines are to be considered.

From the idea of the poisoning of the blood by toxines comes the therapeutic indication of making the interior media antiseptic, and therefore we have recourse to antiseptics (mercury, iodoform, etc.).

I.—**Glaucoma Is a Lymphangitis of the Eye Which Is Cured by Repeated Sclerotomies,** by Dr. GALEZOWSKI (*to follow*).

III.—**Ophthalmological Studies,** by Dr. CHAUVEL.

Regular Astigmatism.—Astigmatism is most common in students. For the statistical figures, I refer to the original article.

December.

I.—Glaucoma Is a Lymphangitis of the Eye Which Is Cured by Repeated Sclerotomies, by Dr. GALEZOWSKI.

In simple glaucoma, where the symptoms commence at the posterior segment of the eye toward the optic disk, the use of repeated sclerotomies, with or without iridectomy, furnishes the most satisfactory results.

In secondary glaucoma with dislocation of the lens, extraction of the lens arrests the inflammatory symptoms, and, in some cases, cures the glaucomatous disease.

From the etiological standpoint, the glaucoma, which is frequently associated with arthritic conditions, more frequent in women than in men, depends essentially upon the form of the eyeball. Thus, in myopia, glaucoma is very rare, and this fact is due to the presence of a posterior staphyloma. In support of this opinion the author publishes a case of complete excavation of both papillæ, with posterior staphyloma and myopia with no sign of glaucoma, and a second case in which there was monocular glaucoma with presbyopia in one eye and myopia with a large posterior staphyloma in the other eye.

Sometimes acute glaucoma is not arrested by an iridectomy. This is because the operation was badly performed. Sometimes the inflammatory symptoms developed by an injury which threatens glaucoma are arrested by sclerotomy. The latter cause the glaucomatous pain provoked by dislocation of the lens, either traumatic or surgical, to disappear.

In some cases, where iridectomy is of no avail, repeated sclerotomies will cure glaucoma. Two cases are given in support of this.

The improvement produced by sclerotomy is not always definite; there are sometimes relapses, and the sclerotomy should then be performed. The author has been successful in operating thus in one case. Sometimes sclerotomy provokes symptoms of sub-acute glaucoma which necessitate iridectomy. In hemorrhagic glaucoma the blood effusions are completely arrested by repeated sclerotomies. In another case sclerotomy only arrested the symptoms for a short time, and they reappeared with greater violence than before, so that it was necessary to renew the sclerotomy.

II.—Spontaneous Pseudo-hemorrhage of the Conjunctiva, by Dr. F. MATHIEU.

This was a case of papilloma which had undergone angiomatous transformation, and which was situated on the left upper lid.

III.—Spontaneous Mydriasis; Cured by Injections of Strychnine, by Dr. MALGAT.

Two sub-cutaneous injections of sulphate of strychnine, in the dose of 1 milligramme, were made, with a Pravaz syringe, daily for a week. After the ninth injection the pupil of the affected eye returned to its normal dimensions.

IV.—A Singular Ophthalmoscopic Image, by Dr. SCHWARZCHILD.

It appears as a white crescent upon the retina which, during the examination of the erect image, takes the form of a circle. The phenomenon is due to an alteration in the internal structure of the lens.

IV.—BOOK NOTICES

BOOKS AND THESES

Metastatic Purulent Ophthalmia from a Prognostic and Etiological Point of View, by Dr. AXENFELD. (Pub. by *Engelmann*, Leipzig, 1894.)

The two important memoirs which Dr. Axenfeld has devoted to metastatic ophthalmia appear to us to be worthy of a detailed analysis on account of the interest which is attached to the subject and the manner in which the author has treated it.

Metastatic ophthalmia is a rare affection, as one can observe in all forms of general pyæmic affections, severe or slight. Axenfeld has collected 64 cases of *metastatic ophthalmia in the course of puerperal fever*, one of which is a case of his own. In 11 observations a bacteriological examination has been made: 9 cases have proved the presence of streptococci, 1 case diplococci, and 1 case the staphylococcus aureus. From all these facts are brought out, from a clinical point of view, the following conclusions: the lowest age of the women is from thirty-one to thirty-two years; they are generally multiparous; the infection is introduced during labor. The first sign of metastatic ophthalmia consists in a diminution of acuteness of vision, which very rapidly, generally in twenty-four hours, culminates in complete blindness, but never causes the sudden blindness of embolism. The affection is usually painful, the pain appearing after some hours or some days. In 2 cases only was the progress painless.

The eye presents the lesion of panophthalmitis, and spontaneous perforation is the rule. In 63 cases the affection was unilateral 41 times, and 22 times bilateral. Sympathetic affection consecutive to unilateral metastatic ophthalmia was not observed, while the collapsed eye has often been the site of a relapse characterized by a reappearance of the pain, necessitating enucleation.

All the patients in whom both eyes were nearly simultaneously affected died in from one to four days after the onset. A single case of Hirschberg terminated in recovery. Of 41 patients suffering from unilateral metastatic ophthalmia, 14 recovered and 27 died. Formerly, we believed that there existed a correlation between endocardiac lesions and metastatic ophthalmia. As a matter of fact, endocarditis is frequent, but far from being constant. In 26 autopsies the endocardium was healthy; 13 times in 51 cases there existed no other metastatic focus. Anatomical examination of the eyes teaches us that in unilateral ophthalmia the point of departure is a thrombus of one of the membranes (retina, choroid) of the eye, while in bilateral ophthalmia retinal emboli oftener occur.

As to the ophthalmoscopic lesions, one has only very rarely the opportunity to observe them. Litten and Hernnheiser have seen multiple retinal hemorrhages without embolism of the larger trunks. In bilateral ophthalmia, retinal embolism has almost always been found; but Virchow and Wagenmann have also demonstrated the primary lesion of the choroid.

In unilateral metastatic ophthalmia, it is generally the choroid or the iris which is the primary site of the lesion.

Metastatic ophthalmia in septicæmic or pyæmic surgical infections is a little less frequent than in the puerperal state. Axenfeld has found 46 cases, of which 4 are his own. The course is practically the same as in puerperal metastatic ophthalmia. The .period of appearance of the ocular affection varies from one to forty-one days, counting from the date of infection. The visual trouble is established rapidly and progressively; sudden blindness has never been observed. The affection is not painful at first; pain may appear later, or not at all. Usually, it is a panophthalmitis, with perforation. In 4 cases only there was a direct transition to atrophy of the globe. Bacteriological examination made in 6 cases has given streptococci 3 times, staphylococcus albus twice, and bacillus once. In a single case of Deutschmann the sound eye was attacked with sympathetic troubles one month after the début of the ophthalmia. In 44 cases, 14 times the affection has been bilateral, and 30 times unilateral; 29 patients died, 15 were cured. Death has been more frequent when the affection has attacked both eyes. Endocarditis has been noted 7 times in 16 autopsies. The ophthalmoscopic lesions at the beginning have never been observed. As to the histological lesion, in 3 cases of bilateral ophthalmia there have been 2 cases of multiple capillary emboli of the retina, and 1 case of the optic nerve. In the case of unilateral ophthalmia, Litten has found the site of the affection in the choroid. In 4 cases the suppurative lesion lay in the neighborhood of the equator.

Metastatic ophthalmia in the infectious diseases has been little studied. Axenfeld contents himself with stating that the publications on this subject are weak and the autopsies wanting. We only know that in the course of influenza, scarlatina, measles, diphtheria, smallpox, erysipelas, glanders, and recurrent fever it is possible to have lesions of the choroid or retina.

Metastatic Ophthalmia in Cryptogenetic Pyæmia.—He designates under the name of cryptogenetic pyæmias the medical infections without known point of entrance. Chilling seems to play a part in this provocation. He puts in this list of facts all the cases of ulcerative endocarditis, all cases which follow the type of acute articular rheumatism, all the affections which develop like typhoid fever, meningitis, or miliary tuberculosis. Axenfeld has found 27 observations of metastatic ophthalmia occurring in these conditions, 4 of which are personal observations. The ophthalmia is developed from the first to the eighteenth day of the infection. The duration of the affection in the fatal cases has been from one to three weeks. The visual trouble is developed rapidly and progressively: 13 times panophthalmitis with perforation has been noted; 6 times the passage direct from suppuration to atrophy of the globe.

In one case only has sympathetic ophthalmia been seen to develop after a panophthalmitis (ulceration and perforation). The affection has been bilateral 12 times; 15 times it has attacked only one eye. Ten patients of the first category died. Of the second, 10 recovered. Endocarditis was found in 10 cases out of 12 autopsies. As to the original site of the lesion, in the unilateral cases it is at one time the retina, one time the choroid or the iris; in the bilateral ophthalmia, the embolic lesion is found primarily in the retina. The pneumococcus seems to play an important rôle in this group of metastatic ophthalmias. Axenfeld has found it in two cases. Moreover, the staphylococcus has been found twice, and the streptococcus once.

In the second part of his memoir Axenfeld has studied critically the anatomical conditions and the bacteriology of septic embolus of the eye. What is the value of the character of intra-vascular micro-organisms from the point of view of diagnosing endogenous infections? Wagenmann, in studying suppuration of the eye consecutive to cicatrices of operations or prolapse of the iris, was satisfied of the existence of exogenous infection starting from the wound, his conclusions being founded upon the infiltration of the wound and the existence of micro-organisms about it, and also upon the existence of micro-organisms in the choroid and retina, and their absence from the interior of the vessels. The argument of Wagenmann is without value, and Axenfeld cites several observations of metastatic ophthalmia where, necessarily, the infection was endogenous in origin, and where the absence of micro-organisms from the interior of the vessels was noted.

It is not impossible, however, and certain clinical facts tend to prove it, that endogenous infection might also be produced in the conditions studied by Wagenmann—that is to say, in the case of adherent opacities of the cornea, or even following operations. It is certain, nevertheless, that these endogenous infections form only a small part of post-operative infections.

Axenfeld calls attention to a mistake which was made when certain intra-vascular masses of streptococci were called microbic emboli. If the eye is taken out twenty-four hours after death, it happens that during that time the microbes have multiplied.

A post-mortem proliferation takes place which is easily recognized by the absence of the signs of reaction (leucocytes, lesions of the walls of the vessels) at the spot of the mass of microbes. Wagenmann thinks that in those cases of metastatic ophthalmia there is first produced an infectious embolism of the vessels of the retina, but this hypothesis is in contradiction to the progressive evolution of the visual trouble, which, however rapid, is never violent and sudden, as in embolism. Moreover, Litten is the only one who has found granular detritus about the organisms. In some cases, moreover, the purely microbic nature of the embolic mass is absolutely certain, as stated at first. Axenfeld admits that these microbic bundles come most often from the endocardial vegetations; more rarely, they may come from veins passing through the point of primary infection, or from compact masses found in the blood, circulatory troubles in the eye favoring, perhaps, the development of endogenous infection. In most of the cases where the affection has been bilateral, embolic lesions of the retina have been found. Besides the predisposition of the eye caused by the physiological narrowness of the capillaries, there is perhaps an elective action of the streptococcus and pneumococcus for the retina.

We see, in summing up, that purulent metastatic ophthalmia observed in the different forms of pyæmia is, in one-third of the cases, complicated by ulcerative endocarditis. In one-third of the cases metastatic ophthalmia is bilateral, and it is only this bilateral form which obliges us to give a fatal prognosis. Unilateral metastatic ophthalmia (except that of puerperal fever) accompanies, frequently, mild cases of pyæmia, above all in the cases of cryptogenetic pyæmia referable to the lungs or the meninges. It may be the only metastasis. In bilateral metastatic ophthalmia the ocular affection is often the only metastasis in the area of the carotid. It cannot, then, be the result of the dissemination of large embolic masses, for these would cause metastasis in other parts of the head and neck. In bilateral metastatic ophthalmia it is the retina which is infected, and a large embolus could not pass into the two central arteries. Infection of the fine capillary vessels occurs very much sooner in these cases, this being very much more in accord with the clinical evolution: rapid but not sudden blindness. While in cases of puerperal and surgical metastatic ophthalmia we find, above all, the streptococcus, and sometimes the staphylococcus, in the cases of cryptogenetic origin the pneumococcus seems to play an important rôle. Ophthalmia caused by the pneumococcus passes more often than the others to atrophy without panophthalmitis.

The term metastatic choroiditis is bad, since it is very often the retina which is primarily attacked. It is, therefore, preferable to group all these cases under the designation of metastatic ophthalmia. A very complete bibliographic index finishes this interesting work.—V. MORAX.

A Case of Sarcoma of the Lachrymal Gland, by M. F. SCHAEFFER. (*Thesis of Giessen*, 1895.)

A man of fifty-one years, with a history of influenza three months before entrance into the service of Professor Vossius. At that time he himself noticed a swelling of the external portion of the right upper eyelid, a swelling which increased without pain. It proves to be a tumor, slightly resistant, without adherence to the soft parts of the eyelid, and seated just below the orbital ridge, situated in the orbit at the site of the lachrymal gland. The tumor is the size of a cherry. The upper eyelid cannot be elevated, and elevation of the globe is a little limited. On turning the lid, one sees the tumor, the surface of which appears to be smooth, but on palpation proves to be nodular. No adherence to the globe of the eye, which is normal. Extirpation of the tumor on July 5, 1894. In February, 1895, it had not reappeared.

Gross examination showed the existence of several nodules in the thickness of the lachrymal gland. These nodules were formed of a tissue quite rich in capillaries, and corresponded to the type of a round-celled sarcoma. The vascular walls were thin, and showed, at certain points, hyaline degeneration.

The author has followed his observations by a complete bibliography of tumors of the lachrymal gland.—V. MORAX.

Twenty-fifth Report of Ophthalmic Clinic of Prof. Hirschberg. (Berlin, 1895.)

In this interesting report, Professor Hirschberg gives us a general account of his twenty-five years of practice ; he shows us to what operative procedures his experience has led him, and what advantages his labors have received in surgical intervention. Two cuts complete the description of the operating theatre and the sterilization apparatus. The numerous Greek and Latin quotations interlaced with the text, a study of the history of specialization among the Egyptians, Greeks, and Romans, prove to us, moreover, that the practice and study of ophthalmology is not incompatible with erudition.—V. MORAX.

Clinical and Therapeutic Treatises on Hysteria, by Dr. GILLES DE LA TOURETTE. (*Plon and Nourrit*, ed. Paris, 1895.)

This is a work in two handsome volumes which contains an engraving of Professor Charcot and 63 cuts in the text. It does not enter into the scope of our journal to analyze even casually the work of Dr. Gilles de la Tourette, but hysteria comes close enough to the science of ophthalmology for the work to be interesting for the specialist to consult. It is a strong work, and does great honor to its author.—V.

MEDICAL JOURNALS

Œdema of the Upper Eyelid in the Course of Scarlet Fever, by Mr. SIDNEY PHILLIPS. (*Brit. med. Journ.*, Jan. 26, 1895.)

Case I.—H. N——, girl twelve years of age, was admitted to the hospital September 5, 1892. She had a very severe attack of scarlet fever, with temperature 104° (Fahrenheit) during several days, and delirium. On September 14 the temperature fell to 100°, but rose again September 15 to 104°, and on September 16 the left upper yelid became red and œdematous to such a degree that it could not be raised. At the same time pus formed in left ear. September 18, the otorrhœa ceased, but the mastoid process became painful and the swelling of the upper eyelid increased. There was neither exophthalmus nor injection of the conjunctiva, but the œdema extended to the cheek.

September 21 the swelling had diminished, but, as there existed a little palpebral fluctuation, an incision was made on October 10, with escape of a little pus. One or two weeks later the patient was completely cured.

She had a little albumen in her urine, but only at the time of the acute exacerbation of the fever.

Case II.—W. W——, eight years of age, had scarlet fever two months ago; albumen in the urine, and a swelling of the left upper eyelid so great that it was black and blue. She could not herself open the eye, and the conjunctiva was injected. The whole terminated by inflammation of the middle ear, which perforated the tympanum. After that the swelling disappeared.

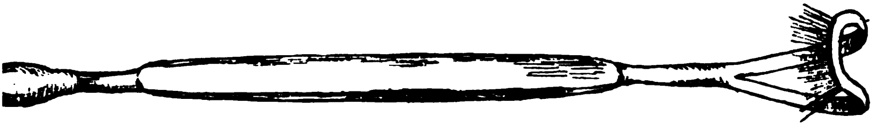
Case III.—V. S——, suffering from scarlet fever, had, ten days after admission, an intense swelling of the right upper eyelid. Nineteen days later, the tympanum was perforated without pain. Then the swelling diminished. The patient never had albumen.

These cases are not connected with the presence of albumen in the urine, but with the suppuration in the middle ear.—DE B.

A Lid Speculum and Douche, by Dr. FAGE.

(*Gazette Médic., Picardie*, Feb., 1895.)

The greater part of douche specula which have appeared in recent years have been provided with a blade pierced with little holes only, which stop up easily and give an insufficient stream. Fage has had an instrument constructed which, while retaining the form of a handle speculum, has a blade with a large finestra which carries along its anterior border a groove with blunted edges, by which the liquid escapes, not in fine jets, but in a sheet; thus an abundant irrigation of the conjunctival cul-de-sac can be obtained.



This irrigation, convenient for disinfection preparatory to operation, renders genuine service in the treatment of conjunctivitis and keratitis.—V.

A Case of Congenital Unilateral Ptosis, by Dr. MARY PUTNAM JACOBI. (*Medical Record*, February 23, 1895.)

Dr. Mary Putnam Jacobi reports a case of unilateral congenital ptosis in a child a year old, well developed in every respect, except the defect of the left eye. This was apparently smaller than the other, and closed by the fall of the upper lid. Not only was the elevator palpebræ evidently paretic, but the orbicularis seemed ill-developed, a fact which suggested that the fault of the lid was due to imperfect development of the muscle rather than to paralysis of the nerve.

The eyeball was subject to nystagmic oscillations ; vision apparently normal, pupils equal, and reacting each normally to light. No other ocular muscle affected.—S.

Legislation for the Prevention of Blindness, by Dr. CHARLES H. MAY. (*Med. Record*, N. Y., Feb. 16.)

After reviewing the methods in vogue for the prevention of *ophthalmia neonatorum*, laying stress upon the success following the introduction of Credé's method of prevention, the writer introduces tables showing the cases treated in the various hospitals and eye clinics of New York. He strongly urges the necessity for effective legislation for the prevention of blindness. C. W. S.

Etiology and Treatment of Internal Strabismus, by Dr. HOWARD F. HANSELL. (*Journal American Med. Association*, February 16.)

Concludes that the amblyopia of strabismus is congenital, and is not improved in cases of marked deviation by tenotomies ; that in monocular squint the squinting eye always turns upward, and that in alternating squint the non-fixing eye turns up. He thinks that atropia and full refractive correction are, in many cases, curative.

C. W. S.

A Suggestion as to the Treatment of Penetrating Wounds of the Ciliary Region and Lens, by Dr. ROBERT L. RANDOLPH. (*New York Medical Journal*, February 25, 1895.)

Penetrating wounds of the ciliary region and lens in the majority of cases lead to the loss of sight. Sympathetic ophthalmia usually has its origin in an injury of this region.

While not in favor of temporizing, the author points out the fact that sympathetic ophthalmia rarely occurs in these cases within three weeks after the injury. In the meantime much may often be done to allay irritation and avert the loss of the organ. In many instances the chief source of irritation is a lens wounded in the accident, which by swelling has become enlarged and is pressing on the already inflamed ciliary body and iris, and by stretching the wound made by the foreign body, provides continuous entry for infecting germs. Here the lens should be removed. Three cases are reported in which the eye was saved and valuable sight restored after it had apparently been lost.

The most favorable cases for operation are those where the wound is small and located at the corneo-scleral margin, and where it is not only easy to enlarge the wound, but is also the most natural point for the egress of the lens.—BOYER.

Paralysis of the Third Nerve Associated with Disturbances in the Region of the Seventh Nerve (Syphilitic Origin), by Dr. DINEUR. (*Arch. méd. de l'armée belge*, Jan.)

The patient, twenty-six years of age, admitted infection of not over a year; presented the complete picture of paralysis of the third pair. Moreover, salivary and gustatory troubles showed that the corda tympani, branch of the facial, was also involved.

Under the influence of Gibert's syrup the patient completely recovered.

He suffered from periostitis of the cranium, demonstrated by severe pain. This periostitis, very probably, was situated at two points: the first was situated at an indeterminable point in the cranial course of the third nerve, the second affected the periosteum of the special canal by which the corda tympani passes by the tympanum.—D.

Direct Massage of the Lens for the Ripening of Cataracts, by Dr. PIPINO. (*Med. Rec.*, Feb. 2.)

The method most employed is that of Foerster. The principal objection attached to it is that the iris is mutilated, and that the cornea may be injured by the massage.

The process of direct massage invented by Boern Bettman is the best to employ. M. Pipino has practised this operation seven times, and has never had occasion to regret the intervention.

One of the principal objections that has been made to this operation is the possible rupture of the superior ligament and the dislocation of the lens; this accident is only due to the clumsiness of the operator. It is only necessary to use gentle pressure, which will be sufficient to produce a traumatic cataract in twenty-four hours. In the majority of cases the lens will be opaque by the end of the week.

In the cases observed by the author four weeks later, simple extraction proved to be practicable, and this was followed by good vision. No iritis. This affection had been guarded against by the instillation of atropine.—De B.

V.—MISCELLANY

NEWS

There was held on June 7 last, at Amsterdam, under the presidency of Professor H. Snellen, the second meeting of the preparatory commission for the International Conference concerning the application of medicine on railroads and ships.

The discussion, at this meeting, turned upon the necessary measures to test the acuteness of vision of railroad employees. We shall return to this discussion and the reports of H. Snellen, Juda, and Westhoff which were read there, *à propos* of the International Conference, which is to take place at Amsterdam in the month of September next.

The programme of the Conference, moreover, comprises the subject of the personal medical service of transportation companies, and hygienic measures to be taken in the interest and safety of travellers (ventilation, dining-car service, bathing, disinfecting, etc.).

The Societies and the medical members have invited the transportation companies to send representatives to this conference.

CORRESPONDENCE

My Dear Colleague:

In the January number of *Annales d'Oculistique* (English edition), which I have just received, I find an article by Dr. A. Darier, on "Vascularization of the Anterior Surface of the Lens," with the observation that he had not been able to find an analogous case in the whole (?) of ophthalmological literature.

In my communication "Observations on 400 Cataract Extractions Performed by Prof. O. Haab, of Zürich," in *Archives of Ophthalmology*, edited by Drs. Knapp and Schweiger (XXV., pages 41 to 109), there appears a similar case. [The article of Dr. Arnold is abridged in the English edition, Vol. XXII., p. 462, and this case is not included.]

The observation was made in 1890, and was regarded as a vascularization of a papillary membrane and not of the lens itself, and I am convinced that the case of Dr. Darier was of the same kind.

After iridectomy the vessels collapsed and no longer contained blood, the best evidence that their origin was in the iris. As a result of interstitial keratitis blood vessels had developed in the cornea. Observations like these two are not common.

The credit of first describing the corneal vessels of interstitial keratitis belongs, not to Hirschberg, but to E. Nettleship.

Sincerely yours,

Dr. Theo. Arnold.

On Posterior Sclerotomy and Other Operations Succeeding Iridectomy in the Treatment of Glaucoma.

(Open letters in the *Annales d'Oculistique.*)

Dr. Parinaud persists with rare constancy in claiming the paternity for the revival of tapping the vitreous in glaucoma. That is his own affair, and I will content myself with recalling to his memory the reunion of the Society of Ophthalmology in 1885, when he made his first communication, my note of the 20th of July, 1881, to the Surgical Society, and the discussion which took place on the part of Dr. Giraud-Toulon, president, and Dr. Le Fort. Then in 1885, for the communication of Dr. Parinaud the order of the day was altered and the discussion suspended, otherwise I would have said then that which I have had occasion to expose since : that is to say, that posterior sclerotomies, linear or angular, even sclerectomies, have only a temporary effect. Fibrous organization of the imprisoned vitreous is the result, as has been proved to me by histological dissection following experiments in the laboratory. Practically, I have seen the relapse come on regularly after a few weeks or a few months, and rarely more. The relapse has been especially marked in the cases of sclerectomy, where it has manifested itself by a violent and painful onset exactly resembling the first relapse after tapping, and also resembling the primary attack.

But what can we say of the practice which consists in recommending sclerectomy following the puncture with the needle periodically repeated (which the patient, if necessary, can perform himself). I greatly fear that the author here has not been very exact, and I dream of accidents of sepsis and sympathetic troubles, while he warns us to fear nothing but the incomplete cicatrization of the perforated parts.

After having experimented a great deal and invented a little, I ought in truth to avow my return to iridectomy, rendered practical in nearly all cases by the incision of Gayet, or by the aid of the linear muscle knife. No operation has an effect so durable, not even the scleriritomy, contrary to what I had hoped in proposing it and during the first years that followed. The excision of the iris enters in part into the duration of the success, without doubt by the final destruction of a field of innervation, while scleriritomy only relieves temporarily, and only until nervous regeneration.

As to posterior sclerotomy, what should be the site and shape, "it should be reserved as an accessory measure with its own proper indications. Preceding an iridectomy, it causes prompt re-establishment of the anterior chamber, when that fails, and facilitates the operation. Practised soon after iridectomy, it prevents the prolapse of the iris and favors good cicatrization in those cases where one may fear the contrary. It is an operation still indicated in case of non-re-establishment of the anterior chamber after iridectomy, or when the tension persists after that operation." Primary dislocation of the lens has already been recommended by Weber. (General Theory of and Operations for Glaucoma: Chapter on Pathology of my work on the Gland of the Aqueous Humor. *Archives*, 1891.)

DR. NICATI.

P. S.—It is proper to recall that my "article on the cure of glaucoma by transverse equatorial sclerotomy" (Surgical Society of Paris, July 20, 1885), was subsequent to my previous physiological work, "Drainage of the Eye by Catgut" (Society of Biology, June 23, 1877), and the primary credit is therefore due to the clinical essays on equatorial drainage by Dr. de Wecker, dating from the same time, but communicated a little before to the Society of Biology. To Dr. Masselon is due the credit of looking up the exact history of the question.

Response of Dr. Parinaud: Dr. Nicati has often given us evidence of his good intentions, but good intentions and scientific spirit are not the same things. He finds that I persist with a constancy rare, etc. A constancy which manifests itself once in ten years is undoubtedly rare ; as a joke, this is not bad. It is also in attempting to be witty that he explains why he did not object to my communication in 1885. But what had he to object to? I mentioned him (p. 279 of the *Bulletin*), as I have always scrupulously mentioned all those who, to my knowledge, have practised, in whatever manner, tapping of the vitreous. I have even laid stress upon the special principles of his operation, which is in some ways the antithesis of the one which I recommend. He excises beforehand "a large strip of the conjunctiva," made "at the level of the equator," an incision of the sclerotic, "3 to 4 millimetres," exercises, if necessary, pressure upon the globe "until there is a hernia of the vitreous." That this operation may be bad I will not contradict : bad on account of the fibrous organization of the imprisoned vitreous body. I suggested something like this in saying that too large cuts in the sclerotic, with hernia of the vitreous body, did not give good results, probably on account of the cicatricial closure of the cut in the sclerotic. I have repeated time and again that posterior sclerotomy is only useful as a means of avoiding all inflammatory reaction at the location of the cut. Dr. Nicati does, on the contrary, everything that would bring about this reaction. No one that I know, not even himself, practises his operation. Then what does he want? He tries to establish his rights, in attributing all the faults of his operation to the one I practise, and which has for its end the avoidance of them. Though very clever, it does not demonstrate. Moreover, I have never said or thought that posterior sclerotomy could supplant iridectomy.

Dr. Nicati has done this with an evident desire to make himself disagreeable ; however, he does not excite my anger. There is always, I acknowledge, criticism to which I am sensible. Our con*frères* find me exact! That makes me careful. Am I more careful *than he ?*

PARINAUD.

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